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AE000125 Agrobacte
AE009208 Agrobacte
AE009208 Agrobacte
AE009623 Brucella
AF088896 Zymomonas
AF010120 Xanthomon
AE012531 Xanthomon
AE012531 Xanthomon
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AE000493 Escherich
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U14003 Escherichia
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Ralstonia
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U32752 Haemophilus
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                                                                                                       Pred. No. is the number of results predicted by chance to have a score greater than or equal to the score of the result being printed, and is derived by analysis of the total score distribution.
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AL591792 S
AE006218 B
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em_htg_other:*
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οy	581 SerProLeuAlaProPheSerPheAspIleAlaTyrGlyHisSerAspLysIleArg 600	qq	421	ATCCTC
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KEYWORDS SOURCE		Qy	221	Prolle
ORG	ORGANISM Neisserla meninglidis Bacteria: Proteobacteria: beta subdivision: Neisseriaceae:	qq	661	CCCATO
185788	Neisseria.	Qy	241	SerGly
AUTHORS	Ruelle, J. B. Bollumottides backond	qa	721	TCCGGC
		Qy	261	GlnGln
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FEATURE	S	Οy	281	ArgLeu
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qq	61 GCGCCTGCCGCCACCTTTCCGAAACAAGCGGGGGTTTCGCATTGTTCAAAAAAAA	OP OP		GGCATO
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qq		qa	1261	CTGACC
٥y	81 GluValLeuAspLysGluGlnThrGlyPheLeuAläGluGluAlaProAspAsnValLys 100	δy	441	TyrLet
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                               11LeuGlyAlaValThrArgLySGlyTyrProLeuAlaLysLeuGlyAsnThrArg
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Neisseria meningitidis serogroup A strain 22491 complete genome;
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                                                                                                                                            1620
                                                                                                                                                                                                                                       1621 TACCAACTGCCGTTTACGCGCACCCTTTCCGGCGGGGGTGTTCCACGATATGGGCGATGCC 1680
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Submitted (30-MAR-2000) Submitted on behalf of the Neisseria sequencing team, Sanger Centre, Wellcome Trust Genome Campus, Hinxton, Cambridge CB10 1SA E-mail: parkhill@sanger.ac.uk
                                                                                             LeuMetPheArgSerGlyGlyAlaSerSerValArgGlyTyrGluLeuAspSerIleGly
                                                                                                                                                                                                                                                                                   561 AlaAlaAsnPheLysArgMetLysLeuLysHisGlySerGlyLeuGlyValArgTrpPhe
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Neisseria meningitidis 22491
Bacteria; Proteobacteria; beta subdivision; Neisseriaceae;
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/note="Core DNA uptake sequence: gccgtctgaa"
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/trensl_table=11
/production=100003"
/protein_id="CABB3333.1"
/db_xref="GI:7378781"
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complement(2952. .3527)
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                                                                                                                                                                                                                                                                    complement(414. .2438)
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/product_*Nabl dehydrogenase I chain K*
/protein_id=*CAB8335.1*
/db_xref=*GE1:7378783.1*
/db_xref=*SPTREMEL:093009*
/translation=*MITLTHYLVLGALLEGISAMGIFMNRKNVLVLLMSIELMLLAVN
FNITAFSQHIGATAGOIFVFFYLTVAAAESAIGLAIMVLYYRNRQTINVADLDELKG*
/gene=*nuoK*
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                                                                                                                                                                            /transl_table=11
/product="hypochetical protein NWA0004"
/product="hypochetical protein NWA0004"
/protein_id="CAB8334.1"
/db_xref="G1:738782"
/db_xref="SPTREMBL:09JQR9"
/db_xref="SPTR
putative mobilization protein (200 aa), fasta scores; E(): 0, 55.1% identity in 167 aa overlap, and FIC_ECOLI cell filamentation protein FIC (200 aa), fasta scores; E(): 0.093, 29.4% identity in 126 aa overlap*
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             /db_xref="SPTREMBL:09Jx90"
//db_xref="SPTREMBL:09Jx90"
//translation="MTFQLILFYIFAVIILYGAIKTVTAKNPVHAALHLVLTFCVSAM
LMMLMQAEFLGVTLVVVYVGAVMVLFLFVVMMLNIDIEEMRAGFWRHAPVAGVVGTLL
AVALILILVNPKTDLAAFGLMKDIPADYNNIRDLGSRIYTDYLLFFELAAVLLLLGMV
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/note="NMA0005, nuoK, NADH dehydrogenase I chain K, len:
101 aa: simlar to many e.g. NUOK_RHOCA NADH dehydrogenase
1 chain K (EC 1.6.5.3) (102 aa), fasta scores; E():
1.1e-24; 65.0% identity in 100 aa overlap. Contains Pfam match to entry PF00420 oxidored_q2,
NADH-ubiquinone/plastoquinone oxidoreductase chain 4L"
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  /note="Pfam match to entry PF00420 oxidored_q2,
MbH-ubiquinone/plastquinone oxidoreductase chain
score 141.50, E-value 1.5e-38"
complement(3863. .4534)
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/note="Core DNA uptake sequence: gccgtctgaa"
/labal=DUS"
complement(3561. .3866)
/gene="nuok"
complement(3561. .3866)
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/product="NADH dehydrogenase I chain J*
/protein_id="CABB3326.1"
/db_xreff="GI:7378784"
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complement(3863. .4534)
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/gene="nuoJ"
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/EC_number="1.6.5.3"
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/gene="NMA0007

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DEFINITION
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Tettelin, H., Saunders, N.J., Heidelberg, J., Jeffries, A.C.,

Tettelin, H., Saunders, N.J., Heidelberg, J., Jeffries, A.C.,

Tettelin, H., Saunders, N.J., Heidelberg, J., Jeffries, A.C.,

Nelson, K.E., Elsen, J.A., Ketchum, K.A., Hood, D.W., Peterson, J.D.,

Hickey, E.K., Haft, D.H., Salzberg, S.L., White, O., Fleischmann, R.D.,

Dougherty, B.A., Mason, T., Clacko, A., Parksey, D.S., Blair, E.,

Cittone, H., Clark, E.B., Cotton, M.D., Utterback, T.R., Khouri, H.,

Qin, H., Vamathevan, J., Gill, J., Scarlato, V., Masignani, V.,

Plizza, M., Grandi, G., Sun, L., Smith, H.O., Fraser, C.M., Moxon, E.R.,

Rappuoli, R. and Venter, J.C.

Direct Submission

Location, Qualifiers

Location, Qualifiers
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GRADDIENT IE BAKSKGIYEAPGWALCHIAYERLYGIHNEDTIEQYRTNGLRLGRLL
YQGGWFDSQALMLRFTAQRWYAKAYTGEVTLELRRGKDYSILNTESPNLTYQPBELSM
EKVEDAAFTPLDRIGGLTMRNLDITDTRVKLGIYSQSGLLSLGEGSVLPQLGNKQ"
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Nelsseria.

Tettelin, H., Saunders, N.J., Heidelberg, J., Jeffries, A.C.,
Nelson, K.E., Elsen, J.A., Ketchum, K.A., Hood, D.W., Peden, J.F.,
Nelson, K.E., Melt, D.H., Salzberg, S.L., White, O., Fleischmann, R.D.
Dodson, R.J., Mason, W.C., Gwinn, M.L., DeBoy, R., Peterson, J.D.,
Hickey, E.K., Haft, D.H., Salzberg, S.L., White, O., Fleischmann, R.D.
Dougherty, B.A., Mason, T., Clecko, A., Parksey, D.S., Blair, E.,
Cittone, H., Clark, E.B., Cotton, M.D., Utterback, T.R., Khouri, H.,
Pizza, M., Grandi, G., Suni, L., Smith, H.O., Fraser, C.M., Moxon, E.R.,
Rappuoli, R. and Venter, J.C.
Complete genome sequence of Neisseria meningitidis serogroup B
Neisseria meningitidis serogroup B strain MC58 section 203 of
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                                                                                                                                                  Neisseria meningitidis MC58.
Neisseria meningitidis MC58
Bacteria; Proteobacteria; beta subdivision; Neisseriaceae;
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187, .1530
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                                the complete genome
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                                                                                                                                                                                                                                                                                                           AUTHORS
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QTPEGWRVVTMEKDLRRMLLFFKREAYVVILERDRV"
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                                                                                         1813. .2028
/gene="NWB2131"
/note="hypothetical protein; identified by Glimmer2;
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complement(3825, .5054)
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/note="similar to SP:P42602 PID:606028 GB:U00096
PID:1789473 percent identity: 82.74; identified begance similarity; putative"
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/db_xref="GI:7227386"
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/gene="NMB2134"
                                                                 /gene="NMB2131"
1813. .2028
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LLDGFDGDNWSIETEGADLKISRFRFAWKPSELMRRSLHITEISAGDIAIVTRPTPPR
BERPPLLSPDSIDLPAAVYLDRETGKT SNGKFAFDKOTVYTRERLDASYRDBKGHRLD
LKAADTPWSSSSGASVGLKRPFALDTAITWGGLEGKTIHSTARLSGSLKDVRAELA
IDGGNIRLSGKSVIHPPAESLDKTLEEVLVKGFNINPAAFVPSLPDAGLNFDLTAIPS
SPGIALLEGSLDLENNYKAGFARDKOITPROVACKOFVINDPATVHIGHSAALLGRGGI
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RLSGKIDTEKDILDNINGINNYGAGEDVLQTARGKLDGSIGIGGTTASPKISWOLGIG
TARTDGSLAIASDPANGORKLVLDTVNIAAGGGSLGTAGGYLELFKDRLLKLDIRSRAF
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TRFQNDRIGILLDGGARRGRINDLAIANDLGIRNARCGNMANNRLGGRTTASLPDLGALKFPL
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RGQAGYTVARDHYPSGLMFRSGASSVRGYELDSIGLAGPNGSYLPERALLYGSLE
YQLPFTRTLSGAVFHDMGDAAANFKRMKLKHGSGLGVRWFSPLAPFSFDIAYGHSDKR
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RLNLTVADAEVFRNFLPVGGTVKGSLNAAVTLGGSIADPHLGGSINGDKLYYRNOTOG
IILDNGSLRSHIAGRKWVIDSLKFRHEGTAELSGTVGMENSGPDVDIGAVFDKYRILS
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SEKDKLSWLILINRAGSGSSGDNAALSAAAGALLAGQINDRIGLVDDLGFTSKRSRNAQ
TGELNPAEQVLTVGKQLTGKLYIGYEYSISSAEQSVKLIYRLTRAIQAVARIGSRSSG
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AKKRRPLLKLSAALLSVLILAVCFLGWLAGTEAGLRFGLYQIPSWFGVNISSQNLKGT
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/protein_id="AAF42443.1"
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5845	GAAGTATTGGACAAGGAACAGACGGGCTTCCTCGCCGAAGAAGCGCCGGACAACGTTAAA : ThrMelleuArgSerlysGlyTyrPheSerSerLysYalSerLeuThrGluLysAspGly :	5904
	ACGATGCTCCGCAGCAAAGGCTATTTCAGCAGCAAAGTCAGCCTGACGGAAAAAAAGAGGA	
5 1	AlatyrthrvalHisilethrproGlyproArgthrlysilealaAsnvalGlyvalAla : 	140 6024
2	IleLeuGlyaspileLeuSeraspGlyasnLeualaGluTyrTyrargasnalaLeuGlu	160 6084
5	AsnTrpGlnGlnProValGlySerAspPheAspGlnAspSerTrpGluAsnSerLysThr 	180 6144
81	SerValLeuGlyAlaValThrArgLysGlyTyrProLeuAlaLysLeuGlyAsnThrArg ;	200 6204
01	spLeuAsnValValAspSerGlyArg : 	220 5264
21 65	ProllealapheGlyAspPheGlulleThrGlyThrGlnargTyrProGluGlnIleVal :	240 5324
41	SerGlyLeuAlaArgPheGlnProGlyThrProTyrAspLeuAspLeuLeuLeuAspPhe	260 5384
61 85	AspPheasp	280 5444
81 45	ArgLeuGinGlyAspArgValProValLysValSerValThrGluValLysArgHisLys : 	300 5504
01	LeuGluThrGly1leArgLeuAspSerGluTyrGlyLeuGlyGlyLys1leAlaTyrAsp 	320 656 4
21 65	TyrTyrAsnLeuPheAsnLysGlyTyrIleGlySerValValTrpAspWetAspLysTyr :	340 5624
41	eSerGinProArgAsnTyrArgGlyAsnTyrTrpThr	360 5684
61 85	SerAsnValSerTyrAsnArgSerThrThrGlnAsnLeuGluLysArgAlaPheSerGly :	380 6744
81	GlylleTrpTyrValargaspargalaGlylleAspalaargLeuGlyalaGluPheLeu :::	400
01	11eProGlySerAsplleAspLeuGlyAsnSerHisAlaThrMet 	
21	LeuThralaSerTrpLySargGlnLeuLeuAsnAsnValLeuHisProGluAsnGlyHis	440 5924
41	rLeuAspGlytysIleGlyThrThrLeuGlyThrPheLeuSerSerThrAlaLeuIle /	
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Raziquani, V., Galeotti,C., Mora,M., Retti,G., Scarselli,M., Scarlato,V., Rappuoli,R., Frazer,C.M. and Grandi,G.

Scarlato,V., Rappuoli,R., Frazer,C.M. and Grandi,G.

Neisseria genomic sequences and methods of their use

Location/Qualifiers

LOCATION (US); THE INSTITUTE FOR GENOMIC RESEARCH (US)

CHIRON CORPORATION (US); THE INSTITUTE FOR GENOMIC RESEARCH (US)

CHIRON CORPORATION (US); THE INSTITUTE FOR GENOMIC RESEARCH (US)

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Neisseria meningitidis
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                                            400
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                                                                                                                                                                                              LeuAlaGlyProAsnGlySerValLeuProGluArgAlaLeuLeuValGlySerLeuGlu
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                                                                                                                                                                                                                                 ArgThrSerAlaArgAlaGlyTyrPhePheThrProGluAsnLysLysLeuGlyThrPhe
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Neisseriaceae;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                neisseria
peptides and
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 PAT
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polypeptides
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  subdivision;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               polynucleotides basb040 vaccine comprising said
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  DNA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   polynucleotides
Patent: WO 0034480-A 5 15-JUN-2000;
RUELLE JEAN LOUIS (BE) ; SMITHKLINE
Location/Qualifiers
1, 1764
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 1764 bp
5 from Patent WO0034480.
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              609
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Db 143735 TGGCACATCAGCTTGGGAACGCGCTTC
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Neisseria meningitidis.
Neisseria meningitidis
Bacteria; Proteobacteria;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             601 TrpHisIleSerLeuGlyThrArgPhe
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  AX026692.1 GI:10187862
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      1 (bases 1 to 1764)
Ruelle, J.L.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Polypeptides and meningitidis and
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Sequence:
AX026692
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          RESULT 6
AX026692
LOCUS
DEFINITION
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SOURCE
ORGANISM
                                                                                                                                                                                                                                                                                                                            501
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BASE COUNT ORIGIN	424 a 581 c 451 g 308 t	Qy		AsnLeuPheAsnLys
Aliqnment		qa	901,	AACCTCTTCAACAA
Pred. No.: Score: Percent Similarity:	2.58e-194 Length: 1764 3019.00 Matches: 579 milarity: 99.15% Conservative: 3	Qy Dp	343	ThrLeuAlaAlaGly
Best Local Query Matc DB:	<pre>y: 98.64% Mismatches: 95.15% Indels: 6 Gaps:</pre>	ογ	363	ValSerTyrAsnArc
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		qq	1141	GGCCGGAAAATCCC
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0y 83	caaricaaksiriiseisesteaakaakensisesteeteeteeteeteeteeteeteeteeteeteeteet	oy 1	443	AspGlyLysileGly
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		ò 6	483	ArgGlyGlnAlaGly
Dp 301	ACGTACACATCACACGGGCCCGCGCACCAAATCGCCAACGTCGGCGTCGCCATCCTC 360	3 8	203	PheAraSerG] vG]
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Qy 203	ValasnProaspThralaThrValaspLeuasnValValValAspSerGlyArgProIle 222 	. δ . δ	1621	ASHPHELYSALGME
	· -	oy 4	583	LeuAlaProPheSe
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Qy 263 Db 721	AlaLeuGluGlnAsnGlyHisTyrSerGlyAlaSerValGlnAlaAspPheAspArgLeu 282 	RESULT AL6460 LOCUS DEFINI	RESULT 7 AL646069/c LOCUS DEFINITION	
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189050 bp DNA linear BCT 07-DEC-2001 1140 1260 1560 442 542 342 402 582 PCGATTCGGAATACGGTTTGGGCGGCAAAATCGCCTACGACTATTAC 900 roteobacteria; beta subdivision; Ralstonia group; GCCAGCTGCTCAACAACGTGCTGCATCCCGAAAACGGCCATTACCTC rgGlnLeuLeuAsnAsnValLeuHisProGluAsnGlyHisTyrLeu erValLeuProGluArgAlaLeuLeuValGlySerLeuGluTyrGln hrArgPhe 609 GI:17429247 olanacearum. olanacearum

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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        GRYGFKTWLREASGESLPDTRSVGAARKAATPVKQYAPEAAOPQAGLFDVEAPPAEV
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Gene name confidence : hypothetical
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predicted by Homology
predicted by FrameD"
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                                                                                                                                                                                                                                                                                                                                                                                                                                     CDS
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Ly Submitted (165-DEC-2001) Genoscope and CNRS UMR-8030, 2 rue Gaston Cremieux, CPS706, 91057 Evry Cedex, France, Laboratoire de Biologie Moleculaire des Interactions Plantes-Microorganismes INRA-CNRS, BP27, 31326 Castanet-Tolosan Cedex, France, Fondation Jean Dausset-CEPH, 27 rue Juliette Dodu, 75010 Paris, France, LMCM CNRS 118 Route de Narbonne, F 31062 Toulouse Cedex 4, Genoscope and INRA URCV, 2 rue Gaston Cremieux, CP5706, 91057 Evry Cedex, France, Laboratoire de Blometrie et Intelligence Artificielle INRA, BP27, F31326 Castanet-Tolosan Cedex. Laboratoire de Genetique Cellulaire INRA, BP27, F31326 Castanet-Tolosan Cedex Christian.Boucherêtculouse.inra.fr http://sequence.toulouse.inra.fr http://sequence.toulouse.inra.fr
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                /function="small molecule metabolism; energy metabolism,
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                                                                                                                                                                                                                                Genome sequence of the plant pathogen Ralstonia solanacearum
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  /transl_table=11
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predicted by Homology
predicted by FrameD"
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(bases 1 to 189050)
                                                                                                                                                                                                                                                                                                                                    Boucher, C.A.
                                                                                                                                                                                                                                                               Unpublished
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Db 177489 GACCTGGCCCGCTACCAGGACCGCAAGACATCACCGACGATCAGTTGCAGTACATGGTC 177430
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   53 PheProValArgIleAspThrGlnAspSerGluIleLysAspMetValGluGluHisLeu 72
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                117546 TACGAGGTCAGGATCGAGGCG---CCCAGGCCGCTGCGGGGACCTGGTGGAGCGCCACCTG
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        160
105
271
38
                                                                putative
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Gene name confidence : hypothetical
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Conservative:
Mismatches:
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Query Match:
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177312 GCGGGCGCGCACCACCATCACACGTCGCGCTGGACTTCACCGGCGCCATCGCGCAG 177253
                                                                                                                                                  GAGCCCAAGCGCATCGACGCGCTGAAGAAGGCC-----TGGGGCCTGCCGCAGGGG 177202
                                                                                                                                                                                                                                                                                                                                                                  176961 GTGGGCGAGGACTATTCGGCCGACCGGCTGCAGGCGCTGGCCGGGCCATCCAGGGCCAG 176902
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         176901 CCGTATTTCGCCAACGCGATCGTCGACCTGGGCGACGATCCGAACAATCCGGTCGCGGCG 176842
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        TATGTCAACAGCCTCTACGGCAGCCTCGACCGCACCAACCTGTCGGGCACCGACACGGGC 176575
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                                                                                                                           SerAspPheAspGlnAspSerTrpGluAsnSerLysThrSerValLeuGlyAlaValThr 187
                                                                                                                                                                                                                                                                        AlaThrValAspLeuAsnValValValValAspSerGlyArgProIleAlaPheGlyAspPhe 227
                                                                                                                                                                                                                                                                                                                                             GlulleThrGlyThrGlnArgTyrProGluGlnIleValSerGlyLeuAlaArgPheGln 247
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                                                                                                                                                                                                  188 ArgLysGlyTyrProLeuAlaLysLeuGlyAsnThrArgAlaAlaValAsnProAspThr
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TVKVSDDAYIVGSEQPAQRPLKMKMDIDVEVGQDKLAFSGGISABLSGNLSWGDA
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GAGVASGLLPGAWIDMLALIAALLLITIGNRYRQGLAELAASRRGSDGQA"
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VAAALI TPPORKLDI TESWSRILMESVGIRAATRRY LDY HRAVQACLEVGPHHOLPM
LGVHPEYQGROIGEQLLAAVQRWCAEDSASQGLVLDTGNARY LDFY ORHGYREIGEVT
LGAVREHVLLHPGETPAAT"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                /product-"conserved hypothetical protein"
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/protein_id="AAG05930.1"
/db_xref="G1:9948600"
/translation="MXALTYLLAIVGLLLALLIGLAALLGTQTGSAWLLGRVPGLQV
SGFEGRLGGAWQAQBESWAQDGTQLVVERPELRWSPACLAGLELCLQRVAAERVALDL
PPSGDSADSGPISLPTLKLPLSIELGEVAVGSFLLDGNQQVAELKLAAHWLADGIHID
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EQPTSAVFSEPAMSQEQALSYLVLGRPMSTGEDSNMLGEAALALGLAGSAPLTGEIAK
QLGIQDFQLDTEGTGNSTSVVASGNITDKLSLRYGVGVFEPANTIALRYQLTKRLYLE
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/db_xref-"GI:9948602"
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                                                                                                                                                                                                                                                                                                       /gene="PA2542"
complement(846. .4511)
/gene="PA2542"
                                                                                                                                                                                                                                                          complement(846. .4511)
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/gene="xthA"
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Complete genome sequence of Pseudomonas aeruginosa PA01, an
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Pseudomonas aeruginosa PA01, section 243 of 529 of the complete
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Direct Submission
Submitted (16-NAY-2000) Department of Medicine and Genetics, University of Washington Genome Center, University of Washington, Box 352145, Seattle, WA 38195, USA
                                                                                                                                                                                                                                                                                                  Db 176166 TTCCAGAGCATCGC---AACGATGTCAACGGCACCACCACCACCAACGACTGCTGTC 176110
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            176109 ACCGGCGGGGTGGAGTACCAGCGCTGGTTCCTGCCGCAATGGGGGCGCCGCGGGTGTTCTGG 176050
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                                                                                                                             Db 176226 GGGGTGCGGCCACGCTGCGCTTTCGCACCGGGCAGCGAGCAGCAGCAGCGGCTACGAT 176167
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Db 176280 ATC-----TTCGTCGCGCGCGCGCAACTGGGCGCGGTGCTCACCGCGGGCGCCGCCGAC 176227
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 556 AspMetGlyAspAlaAlaAsaPheLysArgMetLysLeuLysHisGlySerGlyLeu 575
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Bacteria; Proteobacteria; gamma subdivision; Pseudomonadaceae;
                                                                                516 LeuAspSerIleGlyLeuAlaGlyProAsnGlySerValLeuProGluArgAlaLeuLeu
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/strain="PAO1"
/db_xref="taxon:287"
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144
111
289
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Matches:
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Mismatches:
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Query Match:
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--ccccrcccccccrcrcc 6197
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       180 ThrSerValLeuGlyAlaValThrArgLysGlyTyrProLeuAlaLysLeuGlyAsnThr 199
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                                                                                                                                                                                                                                                                                                         88
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       TTCCAGGGGCAGATCGACAGCGAGGTGAAGGACGGCAAGCCGCGAAGCTCACGCTCAAG
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                                                                                                                                                                                                                                             ---GAGAGCCAGCTTAGCGTGCGCGTCACCCCCGCCAATGCCGCCCTGAAGGCCAATATC
                                                                                                                                                                                                                                                                                                                                                      GAGGCCTATGTGGCTAGCCTCGGCCAGCGGAACGAACGGTTGCAACGT-------
                                                                                                                                                                                                                                                                                                                                                                                                                                GlyPheLeuAlaGluGluAlaProAspAsnValLysThrMetLeuArgSerLysGlyTyr
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             -----TTCCGCCGCAATGCCGAAGCGCAGGCGGAAAAGGCGGCCCAGGCGCTCGGCTAC
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       LeuSerAspGlyAsnLeuAlaGluTyrTyrArgAsnAlaLeuGluAsnTrpGlnGlnPro
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       220 ArgProlleAlaPheGlyAspPheGluIleThrGlyThrGlnArgTyrProGluGlnIle
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 5686 CAGCGCTACACCTTCGGCAAGGTGAGCTTCGACGGCGACTCGATCATCGAGGAAGAACTG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           ValSerGlyLeuAlaArgPheGlnProGlyThrProTyrAspLeuAspLeuLeuAsp
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    260 PheGlnGlnAlaLeuGluGlnAsnGlyHisTyrSerGlyAlaSerValGlnAlaAspPhe
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              AspArgLeuGlnGlyAsp-----ArgValProValLysValSerValThrGlu
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                                                            AsnLysAlaAlaGlyPheAlaLeuPheLysAsnLysSerProAspThrGluSerValLys
                                                                                                                                                                                                                                                                                                      {\tt GluGluHisLeuProLeuIleThrGlnGlnGluGluGluValLeuAspLysGluGlnThr}
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              ArgAlaAlaValAsnProAspThrAlaThrValAspLeuAsnValValValAspSerGly
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                                                                                                                                                                             LeuLysProLysPheProValArgIleAspThrGlnAspSerGluIleLysAspMetVal
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                                                                                                                      CTGAGTACGGCCGCCTTCGCG----
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<pre>Qy 362 AsnValSerTyrAsnArgSerThrThrGlnAsnLeuGluLysArgAlaPheSerGlyGly 381</pre>	Oy 382 IleTrpTyrValArgAspArgAlaGlyIleAspAlaArgLeuGlyAlaGluPheLeuAla 401 	Oy 402 GluGlyArgLysIleProClySerAspIleAspLeuGlyAsnSerHisAlaThrMetLeu 421		Oy 442 LeuaspGlyLysIleGlyThrThrLeuGlyThrPheLeuSerSerThrAlaLeu 459	460 IleArgThrSerAlaArgAlaGlyTyrPhePheThrProGluAsnLysLeuGlyThr 479	Db 4951 GTCGACGCCATGGCCAAGGGCCTGACCAGCTTCGCCGGCGGCCATCGCCTGCTCGGC 4895	Oy 480 PhelleIleArgGlyGlnAlaGlyTyrThrValAlaAspAsnAlaAspValProSer 499	Oy 500 GlyLeuMetPheArgSerGlyGlyAlaSerSerValArgGlyTyrGluLeuAspSerIle 519	Db 4843 TCGCTGCGTTCTTCGCTGGCGCGGCCAGGCGTGCGTGGCTACGGACGCTGCGGCGCTG 4784	Oy 520 GlyLeualaGlyProAsnGlySerValLeuProGluArgAlaLeuLeuVaiGlySerLeu 539	540 GluTyrGlnLeuProPheThrArgThrLeuSerGlyAlaValPheHisAspMetGlyAsp 559		560 AlaAlaAlaAsnPheLysArgMetLysLeuLysHisGlySerGlyLeuGlyValArgTrp 5	4663 GCCTTCAACTCGCTGGACTTCCCGTCGATCAAGACCGGGGTCGGCTTCGGCGTGCGCTGG 4	dy 580 PheSerProLeualaProPheSerPheAspILeAlaTyrGlyHisserAspLysLys 598 dy 1111-11: 11 11 11 11 11 11 1	5 5	4543 TTCCGCCTGCACTTCTCCATGGGG	RESULT 9 AXO78576	z	N AX078576 AX078576.1 GI:13158218		ORGANISM Pseudomonas putida Bacteria; Proteobacteria; gamma subdivision; Pseudomonadaceae;	Pseudomonas. REFERENCE 1 (bases 1 to 1374)		Nelson,K.E., Hickey,E. and Peterson,J. TITLE Dna sequences which are suited for specifically detecting Pseudomonas putida kt2440	JOURNAL Patent: WO 0107624-A 90 01-FEB-2001; THE INSTITUTE FOR GENOMIC RESEARCH (US); QIAGEN GmbH (DE); Gesellschaft fuer Biotechnologische Forschung mbH (GBF) (DE);
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               246
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        463 TTCTCGACCGACGCGCGCGCGCGGCAAGCCAACTGGACCCGCCACTGGGTCAACCCA 522
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              989
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     397 AlaGluPheLeuAlaGluGlyArgLysIleProGlySerAspIleAspLeuGlyAsnSer 416
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          223 GTCACCTTCGGTGGCGACACACCGCTGGACGAGGACCTGCTGCTGCAGGCGATGGTGTCGTTC 282
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             AsnGlyHisTyrSerGlyAlaSerValGlnAlaAspPheAspArgLeuGlnGlyAspArg 286
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          340 ------TyrGluThrThrLeuAlaAlaGlyIleSerGlnProArgAsnTyrArgGly 356
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Deutsches Krebsforschungszentrum (DKF2) (DE) ; Medizinische Hochschule Hannover (DE)
Location/Qualifiers
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                                                                                                                                                                                                                                                                              2 others
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Matches:
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Gaps:
                                                                                                                                  1. .1374 | //organism="Pseudomonas putida" | //organism="Pseudomonas putida" | //db_xref="taxon:303" |
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/db_xref="glicosephosphate"
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/translation="skkintrogrammolokiebemkdytiadlerkogdrekresat
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TSVSTVSSAVGVALAATGGGGGGSNTGTTTTTTSTQ"
2954. 3622
                                                                                                                                                                                        carrying the
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Submitted (26-JUN-2000) Ken Kurokawa, Osaka University, Genome
Submitted (26-JUN-2000) Ken Kurokawa, Osaka University, Genome
Information Research Center; 3-1, Yamadaoka, Suita, Osaka 565-0871,
Japan (E-mail:ken@gen-info.osaka-u.ac.jp,
URL:http://www.gen-info.osaka-u.ac.jp/, Tel:81-6-6879-8365,
Fax:81-6-6879-2047)
   3 (sites)
Yokoyama,K., Makino,K., Kubota,Y., Watanabe,M., Kimura,S.,
Tahli.K. Hattori,M., Abe,H., Ilda,T.,
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100 in 80 aa (Conserved in E.coli K-12)"
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Ohnishi, M., Kurokawa, K., Makino, K., Yasunaga, T., Shinagawa, H. and
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                                                                       Yutsudo,C.H., Kurokawa,K., Ishil,K., Hattori,M., Abe,H., Iida,T., Yamamoto,K., Hayashi,T., Yasunaga,T., Honda,T., Sasakawa,C. and
                                                                                                                                                                                                                                                                                                                                                                                                Hayashi,T., Makino,K., Ohnishi,M., Kurokawa,K., Ishii,K., Yokoyama,K., Han,C.-G., Ohtsubo,E., Nakayama,K., Murata,T., Tanaka,M., Tobe,T., Iida,T., Takemi,H., Honda,T., Sasakawa,C., Ogasawara,N., Yasunaga,T., Kuhara,S., Shiba,T., Hattori,M. and
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Complete genome sequence of enterohemorrhagic Escherichia coli
0157:H7 and genomic comparison with a laboratory strain K-12
DNA Res: 8 (1), 11-22 (2001)
                                                                                                                                                                                 Complete nucleotide sequence of the prophage VT1-Sakai carrylı
Shiga toxin 1 genes of the enterchemorrhagic Escherichia coli
0157:H7 strain derived from the Sakai outbreak
Gene 258 (1-2), 127-139 (2000)
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/organism="Escherichia coli 0157:H7"
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/protein_id="BAB38432.1"
/db_xref="GI:13364486"
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/sub_strain="RIMD 0509952"
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/transl_table=11
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/gene="ECS5008"
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Kurokawa,K., Ishil,K., Hattori,M., Tatsuno,I., Abe,H., Iida,T.,
Yamamoto,K., Ohnishi,M., Hayashi,T., Yasunaga,T., Honda,T.,
Sasakawa,C. and Shinagawa,H.
Complete nucleotide sequence of the prophage VT2-Sakai carrying the
verotoxin 2 genes of the enterohemorrhagic Escherichia coli O157:H7
derived from the Sakai outbreak
Genes Genet. Syst. 74 (5), 227-239 (1999)
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Escherichia coli O157:H7 DNA, complete genome, section 19/20.
AP002568 BA000007
AP002568.1 GI:13364484
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Escherichia coli 0157:H7 (strain:0157:H7, sub_strain:RIMD 0509952)
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Escherichia,
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                                                                                                                                                                                                                                                                                                                                                                                                                                  970 -------AACCACCGCTTTCTCGGACGCGTACAGTTTGGTGGCAGTGCAACCAAT 1017
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802 CTGATGCCGGCCGTCAGCTTTTCCTTCCTGCGCAGT-----GACAACCGTATCGATCG 855
                                                                                                                                                                                                               449 ThrLeuGlyThrPheLeuSerSerThrAlaLeuIleArgThrSerAlaArgAlaGlyTyr 468
                                                                                                                                                                                                                                                                                      916 ACC-----AACCTGCTGCACGCAACGTATTGCTCAAAGGCCTGACCACACTCGGCCAC 969
                                                                                                                                                                                                                                                                                                                                                                  469 PhePheThrProGluAsnLysLysLeuGlyThrPheIleIleArgGlyGlnAla----- 486
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                                                                                                                    ------AspGlyLysIleGlyThr
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Ohnishi, M., Murata, T., Nakayama, K., Kuhara, S., Hattori, M.
                                                                   437 GluAsnGlyHisTyrLeu------
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TVPESPRWLMSRGKODGAEGTLRKIMGNTLATQAVQEIKHSLDHGRRTGGRLLMFGVG
VIVIGVMLSIFQQFVGINVLLYYAPEVFKTLGAVDIALLQYTIVGVINLTFTVLAIM
VLVBFFGRFRLQIIGALGMAIGMFSLGFTSTAOAPGIVALLSMLFYVAAFAMSWGPVCW
VLLSEFPNAIRGRALAIVAAQMLANYFYSTATAPMINKNSWLYAHFHNGFSYWIYGG
MGVLAALFWMKFVPETKGKTLEELEALMFFKTQQTATL"
                                                                                                                                                                                                                                                                                                                       /translation="mytoynssyifsitlyatigglifgydtavisgtveslntvfva
PONLSESAANSLIGFCVASALIGCIIGGALGGYCSNRFGRRDSLKIAAVLFFISGVGS
AWPELGFTSINPDNTVPVYLAGYVPEFVIYRIIGGIGVGLASMLSPMYIAELAPAHIR
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                                                                                                       /note="similar to XYLE_ECOLI gi!1790463 percent identity 100 in 491 as (Conserved in E.coli K-12)" /codon_start="/evidence=not_experimental
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Db 211436 CTTTCTACGATTGAAAGTGATGAAGTGACGCCAGACCGTCGC-----TTTCGCGCA 211486
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 74 LeuIleThrGlnGlnGlnGluGluValLeuAspLysGluGlnThrGlyPheLeuAlaGlu 93
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Db 211487 CGCGTCGATGATGCTATCCGCGAAGGTCTGAAAGCGCTGGGTTATTACCAGCCGACCATT
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Matches:
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Lunxett, v. 111.

Direct Submission

Submitted (13-OCT-1998) Laboratory of Genetics, University of Submitted (13-OCT-1998) Laboratory of Genetics, University of Misconsin, 445 Henry Mall, Madison, WI 53706, USA

On Sep 9, 1997 this sequence version replaced gi:1790660.

This sequence was determined by the E. coli Genome Project at the University of Wisconsin-Madison (Frederick R. Blattner, director). Supported by NIH grants H600301 and H601428 (from the Human Genome Project and NCHGR). The entire sequence was independently determined from E. coli K12 strain MG1655. Predicted open reading frames were determined using Genemark software. Kindly supplied by Mark Borodovsky, Georgia Institute of Technology, Atlanta, GA, 30332 [e-mail: mark@amber.gatech.edu]. Open reading frames that have been correlated with genetic loci are being annotated with CG Site Nos., unique ID nos. for the genes in the E. coli Genetic Stock Center (CGSC) database at Yale University, Kindly supplied by Mary Berlyn. A public version of the database is accessible (http://cgsc.biology.yale.edu). Annotation of the genome is an ongoing task whose goal is to make the genome sequence more useful by correlating it with other data. Comments to the authors are appreciated. Updated information will be available at the E. coli Genome Project's World Wide Web site (http://www.genetics.wisc.edu). *** The E. coli K12 sequence and its annotations are periodically updated; this is version M34. No sequence changes. Annotation updates: updated gene identifications and products; all new functional assignments courtesy of Monica Riley; added promoters, protein binding sites, and repeated
                                                                                                                                                                                                                                                                                                                                                                           AE000493 10819 bp DNA linear BCT 01-DEC-2000 Escherichia coli K12 MG1655 section 383 of 400 of the complete
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Blattner,F.R., Plunkett,G. III, Bloch,C.A., Perna,N.T., Burland,V., Riley,M., Collado-Vides,J., Glasner,J.D., Rode,C.K., Mayhew,G.F., Gregor,J., Davis,N.W., Kirkpatrick,H.A., Goeden,M.A., Rose,D.J., Mau,B. and Shao,Y.
                                                          Db 212888 AGCGATATTCGCCGCAGCGACTTTAAAACCGGTACCGGGGTCGGCGTACGCTGGGAATCG 212947
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Submitted (16-JAN-1997) Guy Plunkett III, Laboratory of Genetics,
University of Wisconsin, 445 Henry Mall, Madison, WI 53706, USA.
Email: ecoli@genetics.wisc.edu Phone: 608-262-2534 Fax:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Direct Submission
Submitted (02-SEP-1997) Guy Plunkett III, Laboratory of Genetics,
University of Wisconsin, 445 Henry Mall, Madison, WI 53706, USA.
Email: ecoli@genetics.wisc.edu Phone: 608-262-2534 Fax:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Bacteria; Proteobacteria; gamma subdivision; Enterobacterlaceae;
Escherichia.
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Blattner, F.R.
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Plunkett, G. III.
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Mismatches:
Indels:
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379.50
39.46%
24.66%
11.96%
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Best Local Similarity:
Query Match:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                repeat_region
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Pred. No.:
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RLVTCL"
sequences described in reference 1. The unique numeric identifiers beginning with a lowercase 'b' assigned to each gene (protein or RNA-encoding) are now designated as gene synonyms instead of labels. This should allow them to be searched for in Entrez as gene
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             /translation-"mAPHRRNTQOEITMKIFQRYNPLQVAKYVKILFRGRLYIKDVGA
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q	4956 CTTTCTACGATTGAAAGTGATGAAGTGACGCCAGACCGTCGCTTTCGCGCA 5006	<u>a</u> :	5 //BC	Greechtercecracted
रु व	94 GlualaproaspasnValLysThrMetLeuArgSerLysGlyTyrPheSerSerLysVal 113	} 8	434 L 5928 C	434 Leunistrociuasheiy 5928 CTGCGCTGGAGTCTCGAC
à		oy d	454 L	454 LeuSerSerThrAlaLeu:::
ð	5067 GAATTIGATCICCGICCACGCCAAAGAAAGGCGGCAGGIATTGAICGCCAAAGTCACG 5126	G 8		
≿ ₽	128 ProGlyProArgThrLysIleAlaAsnValGlyValAlaIleLeuGlyAspIleLeuSer 147 	ි සි	6048 G	5048 GACTCGCAACGCTACTCT
<u> </u>	148 AspGlyAsnLeuAlaGluTyrTyrArgAsnAlaLeuGluAsnTrpGlnGlnProValGly 167 	ζο q	470 - 6108 T	470PheThrProGlu ::: 6108 TCCGTTTTCCAGGCGCAG
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<u></u>	188 ArgLysGlyTyrProLeuAlaLysLeuGlyAsnThrArgalaAla 202 	දි අි	6228 C	6228 CGTTCTTCGCCGGGGGG
<u>کر</u> ج	ValAsnProAspThrAlaThrValAspLeuAsnValValValAspSerGlyArgProIle	ç g	522 A 6288 A	522 AlaGlyProAsnGlySer 6288 AAATACGCCAACGGTGAC
9 &	534.3 CTCGGCCTGCATAAAGCCTTCTGGGATATTGATTATAACAGTGGCGAACGTTAC 5396 223 AlaPheGlyAspPheGlulleThrGlyThrGlnArgTyrProGluGlnIleValSerGly 242	δō	542 'G 	542 GinLeuProPheThrArg
ą		g 8	6348 C	6348 CAGTACAACGTGACCGGA
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× 40		Qy Op	599 I : 6528 T	599 IleArgTrpHisileSer :::::::: 6528 TTACAGTTTTACATCGGT
20 20 20 20 20 20 20 20 20 20 20 20 20		RESULA AE005 LOCUS DEFIN	RESULT 12 AE005654 LOCUS DEFINITION	AE005654 Escherichia coli
<u> </u>	322 TyrAsnLeuPheAsnLysGlyTyrIleGlySerValValTrpAspMetAspLysTyrGlu 341 	ACCE	ACCESSION VERSION KEYWORDS	of 290. AE005654 AE00517 AE005654.1 GI:1
× 8	ThrThtLeuAlaAlaGlyIleSerGlnPrOArgAsnTyrArgGlyAsnTyrTrpThrSer	SOURCE	URCE	Escherichia coli Escherichia coli Bacteria; Protec Escherichia.
<u>خ</u>	luLysArgAlaPheSerGlyGly	REFE	REFERENCE AUTHORS	1 (bases 1 to 1 Perna, N.T., Plun
ą	5763 GACTTCAGCTATAAAATGCCGCTGCAGAAT			Posfal,G., Hacke Grotbeck,E.J., D
<u> </u>	382 IleTrpTyrValArgAspArgAlaGlylleAspAlaArgLeuGlyAlaGluPheLeuAla 401 	T	TITLE	Apodaca, J., Anan Welch, R.A. and E Genome sequence
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11760 bp DNA linear BCT 21-MAR-2001
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of enterohaemorrhagic Escherichia coli 0157:H7
9), 529-533 (2001)
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                                                                                     GATCTCTCCAGCGGCTGGCAGCGTGCCATT----AAC
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us-09-857-669-2.rge

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COMPLEMENT (4926. .5564)
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Proteins - translation and modification"
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/gene="ytfM"
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/function="orf; Unknown function"
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Strain MG1655: B4220"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 /function="putative transport; Not classified"
//note="residues 1 to 447 of 447 are 100.00 pct identical
to residues 1 to 447 of 447 from Escherichia coli K-12
Strain MG1655: B4218"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 /transl_table=11
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/gene="ytft"
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                                                                                                                                              /note="Z5828"
2919. 3164
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5770. .7503
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/gene="ytfM"
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AGDVSLGYALLDDIVSKLKRGKFELQGPGGSIKQCDGWYIYEKIIDDNFAIYIESLG
FALKITGGDFRFRNGSSYULEDEDYSLLYNFLVNAGCQQVELABQVDAIVSANLAADS
DIYKEKICRYKSTIEAFKKEQLALPVLVRRKNSET"
complement(2079. 2633)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    /translation="MLDQVQQLARNAGDAIMQVYDGAKPMDVVSKADNSPVTAADIAA HTVIMDGLRTLTPDIPVLSEEDPPGWEVRQHWQRYWLVDPLDGTKEFIKRNGEFTVNI ALDHGKPILGVYYAPVMWYWYSAAEGKAWKEECGVRKQIQYRDARPPLVVISRSHAD AELKEYLQOLGEHQTYSIGSSLKFCLVAEGQAQLYPRFGPTNIWDTAAGHAVAAAGA HVHDWQGKPLDYTPRESFLNPGFRVSIY"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           1078. .2016
/gene="25826"
/function="orf; Unknown function"
/note="Residues 1 to 133 of 312 are 98.49 pct identical to
residues 1 to 133 of 166 from Escherichia coli K-12 Strain
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                /note="Residues 1 to 246 of 246 are 99.18 pct identical to residues 1 to 246 of 246 from Escherichia coli K-12 Strain MG1655: B4214"
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                          2 (bases 1 to 11760)
Perna, NT., Plunkett,G. III, Burland,V., Mau,B., Glasner,J.D.,
Rose,D.J., Maybew,G.F., Evans,P.S., Gregor,J., Kirkpatrick,H.A.,
Posfai,G., Hackett,J., Klink,S., Boutin,A., Shao,Y., Miller,L.,
Grotbeck,E.J., Davis,N.W., Lim,A., Dimalanta,E., Potamousis,K.,
Apodaca,J., Anantharaman,T.S., Lin,J., Yen,G., Schwartz,D.C.,
Welch,R.A. and Blattner,F.R.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 /function-"phenotype; Central intermediary metabolism:
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/product="affects pool of
3'-phosphoadenosine-5'-phosphosulfate in pathway
                                                                                                                                                                                                                                                                                                                                                                             coli 0157:H7 EDL933"
                                                                                                                                                                                                                        Direct Submission
Submitted (22-OCT-2000) Laboratory of Genetics, Un
Wisconsin, 445 Henry Mall, Madison, WI 53706, USA
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          /note="enterohemorrhagic"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  /protein_id="AAG59412.1"
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/organism="Escherichia
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                                                                                                                                                                                                                                                                                                                                                                                                       /strain="EDL933"
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1078, 2016
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/gene="cysQ"
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PUBMED
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AUTHORS
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TIESDEVTPORTERARYDDAINEGLALGYOPTIEFDLRPPPRKGROULIARWYDGY
PULICGTODVLURGGARTDODYLKLLDPREALGYOPTIEFDLRPPPRKGROVLIARWYDGY
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LGWIETGCAPELS

LGWIETGCAPELS

LOGYTGGLEL

/ FOOD. .11279

/ GROE="Ytin"

/ function="Orf i Unknown function"

/ function="ORF
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gene

CDS

5824 6021 6081 LysileAlaAsnValGlyValAlaIleLeuGlyAspIleLeuSerAspGlyAsnLeuAla 152 98 78 GCTTACTCTGCTTAAGCGGATCTG------AlaTyrAlaProAlaAlaAspLeuSerGluAsnLysAlaAlaGlyPheAlaLeuPheLys 59 ThrGlnAspSerGluIleLysAspMetValGluGluHisLeuProLeuIleThrGlnGln GlnGluGluValLeuAspLysGluGlnThrGlyPheLeuAlaGluGluAlaProAspAsn ---ThrGluLysAspGlyAlaTyrThrVal-----HisIleThrProGlyProArgThr -----AAAGTGATGAAGTGACGCCAGACCGTCGCTTTCGCGCACGCGTCGAT-GATGCT CCACCGCCAAAGAAAGGCCGCCAGGTATTGATCGCCAAAGTCACGCCAGGCGTGCCGGTG AsnLysSerProAspThrGluSerValLysLeuLysProLysPheProValArgIleAsp 5861 YATCGGGACAGCTGGAAAAGAACGTTCGTGCGCAGCTTTCTACGATTG------ValLysThrMetLeuArgSerLysGlyTyrPheSerSerLysValSerLeu--------CCGTCGCCGCGAACGTCCGTCTACAGGTCGAGG-------Length:
Matches:
Conservative:
Mismatches:
Indels: Gaps: (1-11760)US-09-857-669-2 (1-609) x AE005654 1,24e-15 379.50 38.88% 24.57% 11.96% Percent Similarity: Best Local Similarity: Alignment Scores: Query Match: Pred. No.: 6022 33 5825 66 5965 13 5801 79 5909 116 Score: g g q ò g ð qq ò q ò q ò ò ò

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6630
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                                                                                                                                                                                                                                                                                                                                                                                                   GGCTGGTTTAACTCGGTGGTGGTGGCTCCACAATTTGATAAAGCGCGCGAAACGAAAGTA 6528
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    GlyHisTyrLeuAspGlyLysIleGlyThrThrLeuGlyThrPheLeuSerSerThrAla 458
GluTyrTyrArgAsnAlaLeuGluAsnTrpGlnGlnProValGlySerAspPheAspGln 172
                                                                                                                                                                                                                                             GluIleThrGlyThrGlnArgTyrProGluGlnIleValSerGlyLeuAlaArgPheGln 247
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       LysGlyTyrIleGlySerValValTrpAspMetAspLysTyrGluThrLeuAlaAla 346
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         AspargalaglylleaspalaargLeuGlyalaGluPheLeualaGluGlyargLysIle 406
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 ------TrpLysArgGlnLeuLeuAsnAsnValLeuH1sProGluAsn 438
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            GluAsnLysLysLeuGlyThr-------PheileIleIleArgGlyGlnAla 486
                                                                                                                       ------ProLeuAlaLysLeuGlyAsnThrArgAlaAlaValAsnProAspThr 207
                                                                                                                                                                                                                                                                                                           248 ProGlyThrProTyrAspLeuAspLeuLeuLeuAspPheGlnGlnAlaLeuGluGlnAsn 267
                                                                                                                                                                                                                                                                                                                              GAGGGCGATGAGTACGAAACGAAAGATCTGGCAGAAACTGAACCGCCGACTTTCTGCTACC
                                                                                                                                                                                                                                                                                                                                                                                                                              ---ProValLysValSerValThrGluValLysArgHisLysLeuGluThrGlyIleArg
                                                                                                                                                                                                                                                                                                                                                                                                                                                      6772 AAGCGCACTGACCTACGATACCGAGTCTGACTCCACTACGCTGGTGGCTTCTCGCTAC
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ATTACCGCACGCCTCATGCCAACCTGGGGGGACTCGCAACGCTAC
                                                                                         GGCGATTATGAAAATTTCAAAAAGTCCTTAACCAGCATTGCGTTGCGTAAAGGTTATTTC
                                                                                                                                                                                                       6589 TACTICTACGGACGGCGCGCGCGTGAAAGCGACGTGG-------AAA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              ArgSerThrThrGlnAsnLeuGluLysArgAlaPheSerGlyGlyIleTrpTyrValArg
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  GACTATTTGAAA----TTGCTCGATACTCGCCCGGCTATTGGCACGGTACTGAACCAG
                                                            AspSerTrpGluAsnSerLysThrSerValLeuGlyAlaValThrArg1ysGlyTyr---
                                                                                                                                            GATAGCGAATTTACCAAAGCGCAGCTGGGC-----ATTGCGCTCGGCCTGCATAAA
                                                                                                                                                                                    AlaThrValAspLeuAsnValValValAspSerGlyArgProlleAlaPheGlyAspPhe
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            LeuAspSerGluTyrGlyLeuGlyGlyLysIleAlaTyrAspTyrTyrAsnLeuPheAsn
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     AAACCGTGGATGAACTCATAC-------GGTCACAGTCTGACCAGTACC
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153
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DD928(EC27-278), DD930(EC30-188),
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                                                                                                                                                                                                                                                                                                                                                                                                                                               /label=ORF_f132p
/protein_id="AAA96985.1"
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/note="ORF_f510"
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/transl_table=11
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Escherichia coli K-12 chromosomal region from 92.8 to 00.1 minutes.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            On Apr 17, 1996 this sequence version replaced gi:536929.
His sequence was determined as part of the E. coli Genome Project (Frederick R. Blattner, director) at the University of Wisconsin-Madison. Supported by award HG00301 from the NIH Human
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Submitted (22-AUG-1994) Guy Plunkett III, Laboratory of Genetics, University of Wisconsin, 445 Henry Mall, Madison, WI 53706, USA. Email: ecoli@genetics.wisc.edu Phone: 608-262-2534 Fax:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Genome Project. The entire sequence was independently determined from E. coli MG1655; overlaps with other sequence determinations are annotated. The start of this entry overlaps the end of the entry ECOUW89 (U00006) by 1885 bp.

Location/Qualifiers
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Bacteria; Proteobacteria; gamma subdivision; Enterobacteriaceae;
Escherichia,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      1 (bases 1 to 338534)
Burland, V., Plunkett, G. III, Sofia, H.J., Daniels, D.L. and
Blattner, F.R.
Analysis of the Escherichia coli genome VI: DNA sequence of the
region from 92.8 through 100 minutes
Nucleic Acids Res. 23 (12), 2105-2119 (1995)
                                                                                                                                                                                      7423 AAACTCGATTTTGCCGTACCGGTCGCGGATAAAGACGAACACGGGTTACAGTTTTACATC 7482
  :::|||| ::: |||| || CAGAACGTCTGGATTTTGTGATTTTGTGATTTTGTGCACGCGCTG 7122
                                                                                                             GGCTGGATTGAAACCGGTGATTTCGACAAAGTACCGCCGGATCTGCGTTTCTTCGCCGGG 7182
                                                                                                                                                                                                                                                      527 SerValLeuProGluArgAlaLeuLeuValGlySerLeuGluTyrGlnLeuProPheThr 546
                                                                                                                                                                                                                                                                                                                                                547 ArgThrLeuSerGlyAlaValPheHisAspMetGlyAspAlaAlaAlaAsnPheLysArg 566
                                                                                                                                                                                                                                                                                                                                                                                                                                               567 MetLysLeuLysHisGlySerGlyLeuGlyValArgTrpPheSerProLeuAlaProPhe 586
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         SerPheAspIleAlaTyrGlyHisSerAspLysLys-----IleArgTrpHisIle 603
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                                                                 GlyTyrThrValAlaArgAspAsnAlaAspValProSerGlyLeuMetPheArgSerGly
                                                                                                                                                            GlyAlaSerSerValArgGlyTyrGluLeuAspSerIleGlyLeuAlaGlyProAsnGly
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/db_xref="taxon:562"
/map="92.8 to 100 minutes"

    .338534
    /organism="Escherichia

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Direct Submission
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ACCESSION
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AUTHORS
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KEYWORDS
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DD933(EC27-1320), DD935(EC30kM32), DD937(EC27-1070), DD941(EC17-142), DD955(EC27-297), DD954(EC27-403), DD945(EC27-407), DD954(EC27-407), DD954(EC27-409), DD954(EC27-409), DD956(EC217-103), DD958(EC30kM1), DD966(EC30kM2), DD966(EC31-104), DD966(EC30kM2), DD967(EC30kM2), DD977(EC30kM7), DD986(EC27-403), DD997(EC19-202), DD997(EC18-23), DD997(EC18-23), DD997(EC18-213), DD997(EC18-13), DD997(EC18-31), DD997(EC18-313), DD997(EC1
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KDGSSVCGTYSDVSNDDIRRLMVGRELQNRFNAMKENVSNLAHETVFEVRNYTSRDR
KRYRDISFSVCRGEILGFAGLVGSGRFELMNCLFGVDKRAGGEIRLNGKDISPRSPLD
AVKKENAITESRENDNGFPRPSIAGNMAISRSLKDGGYKGAMGLFFEVDEGATAENO
RELLALKCHSVNQNITELSGGNQQKVLISKMLCCCPEVIIFDEPTRGIDVGAKAEIYK
VMRQLADDGKVILMVSSELPEIITVCDRIAVFCEGRLTQILTNRDDMSEEEIMAMALP
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GIDDBAKTLGVSVDIFASPSGEDFGSGLGFDLSNKNYKGTAFAPLSSVNLVMPVAR
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AIYCANDTMAMGVAQAVANAGKTGKVLVVGTDGIPEARKMVEAGQWTATVAQNPADIG
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EYFLTTNNITQIFVQSSVTVLIGMGEFFAILVAGIDLSVGAILALSGMVTAKLMLAGV
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/note="promoter matrix score of 55; putative; resembles
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/note="1885 bp overlap with end of GenBank Accession
Number U00006 (ECOWU89)"
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Accession Number U00006
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/note="predicted bend of 73.22 degrees"
complement(3030. .3953)
/note="ORE_f307"
/codon_start=1
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/note="predicted bend of 75.10 degrees"
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complement(2036. .2971)
/note="ORF_f311"
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'note="HisP-like nucleotide binding protein (ATP-binding

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gene
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            /protein_16-*AAA96989.1"
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NVLAFGSRVVGLELAKMIVDAWLGAQYEGGRHQQRVEAITALEQRRN"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Complement(4520...16191)
/note="corresponds to GenBank Accession Number D90227
(ECOPHN) 1. .11672; the related sequence GenBank Accession Number J05260 (ECOPHNAQ) is from E. coli B, not K-12"
/dena="rate."
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Db 133339 CTTTCTACGATTGAAAGTGAAGTGACGCCAGACCGTCGC-----TTTCGCGCA 133389
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          DD 133957 CGCGAAACGAAAGTATTACCATTGACGGGCGTGGTTTCGCCGCGAACAGAAACACCATC 134016
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Db 133450 GAATTTGATCTCCGTCCACCGCCAAAGAAAGGAGGCGGCAGGTATTGATCGCCAAAGTCACG 133509
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            bb 133615 ACGGTACTGAACCAGGGCGATTATGAAAATTTCAAAAGTCCTTAACCAGCATTGCGTTG 133674
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Db 133675 CGTAAAGGTTATTTCGATAGCGAATTTACCAAAGCGCAGCTGGGC------ATTGCG 133725
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Db 133837 CTGGTGCCGTTTAAAGGGGCGGTGAGTACGAATCGAAAGATCTGGCAGAACTGAACCGC 133896
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Db 133897 CGACTTTCTGCTACCGGCTGGTTTAACTCGGTGGTGGTGGCTCCACAATTTGATAAAGCG 133956
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Db 133510 CCAGGCGTGCCGGTGTTAATTGGCGGCACCGATGTGGTATTGCGCGGCGGCGCGCGGACC 133569
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      94 GlualaProAspAsnValLysThrMetLeuArgSerLysGlyTyrPheSerSerLysVal 113
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               188 ArgLysGlyTyr------ProLeuAlaLysLeuGlyAsnThrArgAlaAla 202
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    223 AlaPheGlyAspPheGluIleThrGlyThrGlnArgTyrProGluGlnIleValSerGly 242
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                114 SerLeu------HisIleThr 127
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        148 AspGlyAsnLeuAlaGluTyrTyrArgAsnAlaLeuGluAsnTrpGlnGlnProValGly 167
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          203 ValAsnProAspThrAlaThrValAspLeuAsnValValValAspSerGlyArgProlle 222
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              243 LeuAlaArgPheGlnProGlyThrProTyrAspLeuAspLeuLeuLeuAspPheGlnGln 262
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  GlnGlyAspArgVal---ProValLysValSerValThrGluValLysArgHisLysLeu 301
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            74 LeulleThrGlnGlnGlnGluGluValLeuAspLysGluGlnThrGlyPheLeuAlaGlu 93
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Db 133780 CGCTTTGGCCATGTGACCTTTGAAGGATCACAA---ATCCGCGATGAATACCTGCAAAAT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          D 133390 CGCGTCGATGATGCCATCGCGGAGGTCTGAAAGCGCTGGGTTATTACCAGCCGACCATT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              128 ProGlyProArgThrLysIleAlaAsnValGlyValAlaIleLeuGlyAspIleLeuSer
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           263 AlaLeuGluGlnAsnGlyHisTyrSerGlyAlaSerValGlnAlaAspPheAspArgLeu
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Matches:
Conservative:
Mismatches:
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                                                                                                                                                                                                                                                                                               /gene="phnM"
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379.50
39.46%
24.66%
11.96%
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Best Local Similarity:
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Pred. No.:
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DB:
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302 GluThrGlyIleArgLeuAspSerGluTyrGlyLeuGlyGlyLysIleAlaTyrAspTyr 321	AX033468 AX033468 1737 bp DNA linear PAT 21-SEP-2000 DEFINITION Sequence 1 from Patent W00047737. ACCESSION AX033468 US:10280229
	Haemophilus
342 ThrThrLeualaalaGlyIleSerGlnProArgAsnTyrArgGlyAsnTyrTpThrSer 361 134104 CTGACCACCAGTACTAGTATTTCCGCGCCGGAACAGACCCTC 134145	OKOANISM HaemOphlius influenzae Bacteria: Proteobacteria: gamma subdivision; Pasteurellaceae; Haemophlius. REFERENCE 1 (bases 1 to 1737)
362 AsnValSerTyrAsnArgSerThrThrGlnAsnLeuGluLysArgAlaPheSerGlyGly 381 ::: 134146 GACTTCAGCTATAAAATGCCGCTGCTGAAGAAT	Ruelle, Haemoph Patent: RUELLE
382 IleTrpTyrValArgAspArgAlaGlyIleAspAlaArgLeuGlyAlaGluPheLeuAla 401 ::: 134179	JOELLE (BE) FEATURES Location/Qualifiers Source 11737 /organism="Haemophilus influenzae"
Qy 402 GluGlyArgLysIleProGlySerAspIleAspLeuGlyAsnSerHisAlaThrMetLeu 421 ::: ::: Db 134203 CAGGGCGGTTTTAAGCGCACTGAACGATACCGAATCTGACTCCACTACGCTG 134259	BASE COUNT 517 a 309 c 380 g 531 t ORIGIN
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434 LeuHisProGluAsnGlyHisTyrLeuAspGlyLysIleGlyThrThrLeuGlyThrPhe 453 	: 22.94% Mismatches: 11.79% Indels: 6 Gaps:
454 LeuSerSerThralaLeuIleArgThrSerAlaArgAlaGlyTyrPhe 469 ::: :::	-09-857-669-2 (1-609) x AX033468 (1-1737) 3 IleLysProThrAlaLeuLeuProAlaLeuPhePhePheProHisAlaTyrAlaPro
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482 IleargGlyGlnalaGlyTyrThrValalaArgAspasnalaAspValProSerGlyLeu 501 	130GTCAATGTTAATTGATTAATAAA 63 GlulleLysAspMetValGluGluHisLeuProLeulleThrGlnGlnGlnGluGluVal
502 MetPheargSerGlyGlyAlaSerSerValArgGlyTyrGluLeuaspSerIleGlyLeu 521 	154 GAAGAAATGGATGGCTCCGAACGCTATCAACATTTGGTAACCAAGGC
522 AlaGlyProAsnGlySerValLeuProGluArgAlaLeuLeuValGlySerLeuGluTyr 541 134671 AAATACGCCAACGGTGACCTGAAAGGGGCCTCGAAGTTGATAACCGGATCGCTGGAATAC 134730	QY 103 LeuargSerLySGlyTyrPheSerSerLysValSerLeuThrGluLysAsp119
542 GInLeupropheThrargThrLeuSerGlyAlaValpheHisAspMetGlyAspAlaAla 561 	120GlyalaTyrThrValHisIleThrProGlyProArgThrLysIleAlaAsnVal 13
AlaAsnPheLysArgMetLysLeuLysHisGlySerGlyLeuGlyValArgTrpPheSer:::::::::::::::::::::::::::::::::::	138 GlyValAlaileLeuGlyAspileLeuSerAspGlyAsnLeuAlaGluTyrTyrargAsn 118 111
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òé	198	ASOTTLARGALAANDAANDROASDTHRALATHRVALASDLEUASNVALVALVALASD	217
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δ	238	GlnIleValSerGlyLeuAlaArgPheGlnProGlyThrProTyrAspLeuAspLeuLeu :::::::::::::::::::::::::::::::::	257
QΩ	616		675
ογ	258	LeuAspPheGlnGlnAlaLeuGluGlnAsnGlyHisTyrSerGlyAlaSerValGlnAla	277
qo	919	GATTTTCC	735
Qy	278	AspPheaspArgLeuGlnGlyAspArgValProValLysValSerValThrGluValLys	297
Ωp	736		792
δ	298		317
qq	793	AAAAATGCGATGGAACTCGGTGTGGGCTTTTCTACTGATGGCGGCGTTCACGGACAAATA	852
δ	318	AlaTyr	319
qq	853	GGCTGGACAAAACCTTGGATTAATAGCCGTGGACATAGTTTGCGTTCAAATCTTTATCTC	912
ò	319		319
qq	913	TCTGCACCAAAACAAACTCTAGAGGCAACTTATCGAATGCCACTGCTTAAAAATCCATTA	972
0 y	320	AspTyrTyrAsnLeuPheAsnLysGlyTyrIleGlySerValValTrpAspMetAspLys	339
q	973	ANTHATTACTATGATTTTGCCGTCGGTTGGGAAGGGGAAAAGAGAATGATACCATACCATACC	1032
δ	340	TyrGluThrThrLeuAlaAlaGlyIleSerGlnProArgAsnTyrArgGlyAsnTyrTrp	359
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ογ	360	ThrSerAsnValSerTyrAsnArgSerThr	369
q	1066		1125
ογ	370	ThrGlnAsnLeuGluLysArgAlaPheSerGlyGlyIleTrpTyrVal	385
qq	1126		1185
ολ	386	3	405
ор	1186	CGATTACCTGGTGGTTCCTTTGCCACTTGGGGCGATGTGCAAAAA	1230
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ογ	426	LysArgGlnLeuLeuAsnAsnValLeuHisProGluAsnGlyHisTyrLeuAspGlyLys	445
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qa	1255		1296
ογ	466	AlaGlyTyrPhePheThrProGluAsnLysLysLeuGlyThrPheIleIleArgGly	484
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ογ	485	GInAlaGlyTyrThrValAlaArgAspAsnAlaAspValProSerGlyLeuMetPheArg	504
අ	1348	GAAATCGGGTATTTACATACAAAAGGTATTGAAAAATTCCGCCTACACTGCGTTTCTTT	1407
, oy	505	SerGlyGlyAlaSerSerValArgGlyTyrGluLeuAspSerIleGlyLeuAlaGlyPro	524

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White, O., Clayton, R.A., Kerlavage, A.R. and Fleischmann, R.D.
Direct Submission
Librated (15-301-1995) The Institute for Genomic Research, 9712
Medical Center Dr. Rockville, MD 20850, USA
(Asses I to 11833)
White, O., Clayton, R.A., Kerlavage, A.R. and Fleischmann, R.D.
Direct Submission
Submitted (27-SEP-1997) The Institute for Genomic Research, 9712
Medical Center Dr. Rockville, MD 20850, USA
(Actional Center Dr. Rockville, MD 20850, USA
(Atabase matches have been assigned, product names have been improved, and a number of frame shifts have been corrected. We gratefully acknowledge the work of Tatusov et. al. We have incorporated their annotation into the /notes fields of the corresponding H. Influenzae genes
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        U32752 11833 bp DNA linear BCT 29-MAY-1998 Haemophilus influenzae Rd section 67 of 163 of the complete genome. U32752 L42023 U32752.1 GI:1573692
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         I (bases 1 to 11833)
Fleischmann, R.D., Adams, M.D., White, O., Clayton, R.A.,
Kirkness, E.F., Kerlavage, A.R., Bult, C.J., Tomb, J., Dougherty, B.A.,
Merrick, J.W., McKenney, K., Sutton, G.G., FitzHugh, W., Fleids, C.A.,
Gocayne, J.D., Scott, J.D., Shirley, R., Liu, L.I., Glodek, A.,
Kelley, J.W., Weidman, J.F., Phillips, C.A., Spriggs, T., Hedblom, E.,
Cotton, M.D., Utterback, T., Hanna, M.C., Nguyen, D.T., Saudek, D.M.,
Geoghagen, N.S., Gnehm, C.L., McDonald, L.A., Small, K.V., Fraser, C.M.,
Smith, H.O. and Venter, J.C.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               2 (bases 1 to 11833)
Tatusov, R.L., Mushegian, A.R., Bork, P., Brown, N.P., Hayes, W.S.,
Borodovsky, M., Rudd, K.E. and Koonin, B.V.
Metabolism and evolution of Haemophilus influenzae deduced from
Whole-genome comparison with Escherichia coli
Curr. Biol. 6 (3), 279-291 (1996)
1528 GTCTATCCAAATTGGTGGGCGGCAACTTTTGCAGATAGTGGATTAGCTGCCGATAATTAC 1587
                                                                                                                                                                                                                                                                                564
                                                                                                                                                                                                                                                        565 LysArgMetLysLeuLysHisGlySerGlyLeuGlyValArgTrpPheSerProLeuAla 584
                                                                                                                                                                                                                                                                                                                                            585 ProPheSerPheAspileAlaTyrGlyHisSerAsp......LysLysIleArg 600
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Haemophilus influenzae Rd.
Haemophilus influenzae Rd
Bacteria; Proteobacteria; gamma subdivision; Pasteurellaceae;
                                                                  AsnGlySerValLeuProGluArgAlaLeuLeuValGlySerLeuGluTyrGlnLeuPro
                                                                                                                                                           545 PheThrArgThrLeuSerGlyAlaValPheHisAspMetGlyAspAlaAlaAsnPhe
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      random sequencing and assembly of Haemophilus
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Whole-genome random sequencing and
influenzae Rd
Science 269 (5223), 496-512 (1995)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                   1708 TTTTACATCGGACTTGGTACA 1728
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ACCESSION
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U32752/c
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REFERENCE
AUTHORS
TITLE
JOURNAL
                                                                  525
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AUTHORS
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PUBMED
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MEDLINE
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  VWQCRRTADITDÄLKADGHEEYIRNTTGLAVUPPYFSGTÄVKHILDNVEGAREKAERGE
LILGTYVDTHUVWKLTGGRAVTDYTANASRAMEN HITKGWONKLELIND RESALPEV
RNSSEIYGGPRIGGGVRIPVAGIAGDQDAALYGHLCVHACQDKRITGILD RESALLPEV
GNKAITSKRGLIJTGTACNAKGEPEYALEGSVPIAGASIQWLRDELKIVUDSFDSEYFA
GVKTDSNGVYVVPAFTGLGAPYWDPYRAGAIFGLSKGANRHIVRATLESIAYQTRDV
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ATGFWROLDELRDKARVERTFSPDSDNERRERYKGWKKAVKRSLEWAKEDEE

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WVEHNPMEIWATQSSTLNEVVAKAGITSDEIAAIGITNQRETTIVWEKSTGTPVYNAI
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                                                                                                              (28-MAY-1998) The Institute for Genomic Research, 9712
                                                                                                                                                                      start
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5 (bases 1 to 11833)
White,O., Clayton,R.A., Kerlavage,A.R., Fleischmann,R.D.,
Peterson,J., Hickey,E., Dodson,R. and Gwinn,M.
Direct Submission
Submitted (28-MAY-1998) The Institute for Genomic Research
Medical Center Dr. Rockville, MD 20850, USA
The whole genome was shifted by 588 nucleotides for a new
On Sep 30, 1966 this sequence version replaced gi:1221393.
Location/Qualifiers
                                                                                                                                                                                                                                                           1. .11833
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3297. All
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/gene="H10690"
145. a?
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                ALSFDAGQKSLIQLVDKALDSFSVEQVEGGLQNGLVLKNVRYQTAGIETHIAQARLQL
DEGCLESREVCLRDFTLNKPTAINTALLPPSAFDNSKGSMRRISLETSINABRILVM
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ILPASDVDLTLSGSLKKSTALSLKTKGVLDAELNGNVQLAQDKMPLNLTLNVAKGQYT
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IKGHINNASLSSGKLNIKAEQLHYGGNIKLHLLDLDLSGDEQNHKLILKSQGEPVAAN
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VELCFPQAFRGKQGAIRFCPRKNVLDLVNKLIEDONSLKGAULQYQGNWFTDKPRPQF
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SEDEVILNGPHKSKEELIKREFAAKTKSGMEIRSDLRINIGKDVSLDAYGLKTNLDGL LSXQDOKGNTGLFGQINLTKGRYASFGODLILRKGLISFSGGATQPTPLHBAIRNPET MEDSKITAGVYRUGIAADSPEVITESPESKPODQALSYLLTGRSLESSGEVGSTGSVGA ALIGLGISKSGKLVGSIGEVFGIQDLNIGTSGVGDKSKVTVSGNITNRLQIKYGVGLF GAAGAAATGGATGGCTCCGAACGCTATCAACATTTGGTAACCAAAGCC------ 11530 ------GTGGATCGTGGT 11518 AAACGCGATTTATTGATTGCTCATGTTACACCAGGGGGGGCCAACAAAAATTGCGGGGACT 11398 11055 TCGGATTTAACCAGCGATTTTCCATCTTCAAATTGGTTTAGCTCAGTATTAGTTCAGCT 10996 11352 GCATTGCGTAAAAACTTACCGAAAGATGGCGTTTTGGTTGAGCACCAAACTTACGATGAT 11293 ||||||||:::::: |1292 TACAAACAGCGATTTCACGTTTAGCATTAAATCGTGGGTATTTTGATGGGAACTTTAAA 11233 AGTGGTGTCCGTTATCATTATGCCAATATTACTTTTAGCCATTCACAA---ATTCGGGAT 11116 11115 GATTACTTAAATATATTCTTAACATCAAATCTGGTGATCCGTATTTAATGAATATTT 11056 11397 GATGTGCAAATTGAGGGGGAAGCCGCACAAGATGAAAATTTT--------AAT 11353 GlyValAlalleLeuGlyAspileLeuSerAspGlyAsnLeuAlaGluTyrTyrArgAsn 157 SerGlyArgProlleAlaPheGlyAspPheGluIleThrGlyThrGlnArgTyrProGlu 237 LeuAspLysGluGlnThrGlyPheLeuAlaGluGluAlaProAspAsnValLysThrMet 102 -----GlyAlaTyrThrValHisIleThrProGlyProArgThrLysIleAlaAsnVal 137 AlaLeuGluAsnTrpGlnGlnProValGlySerAspPheAspGlnAspSerTrpGluAsn 177 SerLysThrSerValLeuGlyAlaValThrArgLysGlyTyrProLeuAlaLysLeuGly 197 AsnThrArgAlaAlaValAsnProAspThrAlaThrValAspLeuAsnValValAsp 217 258 LeuAspPheGlnGlnAlaLeuGluGlnAsnGlyH1sTyrSerGlyAlaSerValGlnAla 277 3 IleLysProThrAlaLeuLeuLeuProAlaLeuPhePhePheProHisAlaTyrAlaPro 22 23 AlaalaaspLeuSerGluAsnLysAlaalaGlyPheAlaLeuPheLysAsnLysSerPro 42 11658 ACCGTTGATATTGAAGTTCAAGGCATTCGTGGTTTCCGTGCTGTGCGTAATACAGAT---AspThrGluSerValLysLeuLysProLysPheProValArgIleAspThrGlnAspSer 238 GlnIleValSerGlyLeuAlaArgPheGlnProGlyThrProTyrAspLeuAspLeuLeu GlulleLysAspMetValGluGluHisLeuProLeuIleThrGlnGlnGlnGluGluVal 103 LeuArgSerLysGlyTyrPheSerSerLysValSerLeuThrGluLysAsp------Length: Matches: Conservative: Mismatches: Indels: Gaps: US-09-857-669-2 (1-609) x U32752 (1-11833) 2.93e-15 374.00 36.88% 22.94% 11.79% Percent Similarity: Best Local Similarity: Query Match: Alignment Scores: Pred. No.: 120 138 158 63 83 11457 218 11112 11601 11529 Score:

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δλ	340	35	59
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ò	37	SerGlvGlvIleTrpTvrVal 3	85
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ò	38	ArgaspargalaglyIleaspalaargLeuGlyalagluPheLeuAlagluGlyArgLys 400 	ın
g	10545	3GATGTGCAAAA 10	0501
δ d	40	rHisAlaThrMetLeuThrAlaSerTrp 42	25
a a	-	ACTTTTGATTTAAGC	0
δ	42	gGlnLeuLeuAsnAsnValLeuHisProGluAsnGlyHisTyrLeuAspGlyLys 44 	45
g	10482	3A	0477
ò a	446	<pre>11eGlyThrThrLeuGlyThrPheLeuSerSerThrAlaLeuIleArgThrSerAlaArg 46: 11</pre>	
ò	466	ysLeuGlyThrPhellelleArgGly 48	
qq	10434	TGTCGTTGCTCGTGCT 1	0384
ογ	485	ProSerGlyLeuMetPheArg 50	04
q	10383	riccectracacieceriterr 1	0324
δý	505	erGlyGlyAlaSerSerValArgGlyTyrGluLeuAspSerIleGlyLeuAlaGlyPro 52	24
qq	10323	~	0264
ò	525	AsnGlySerValLeuProGluArgAlaLeuLeuValGlySerLeuGluTyrGlnLeuPro 54.	4 4
qq	10263	1	0204
Oy	54	PheThrArgThrLeuSerGlyAlaValPheHisAspMetGlyAspAlaAlaAlaAshPhe 56	64
QQ			0144
ò	565	LysArgMetLysLeuLysHisGlySerGlyLeuGlyValArgTrpPheSerProLeuAla 58. ::: :::::::::::::::::::::::::::::::	84
δλ	58	• 6	600

LOCUS

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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            /product="peptide methionine sulfoxide reductase"
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            /transl_table=11
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           247. .990
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/function="phenotype; central intermediary metabolism:
Sulfur metabolism"
/note="affects pool of
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B4214; residues 2 to 247 of 247 are 79.26 pct identical to
residues 1 to 246 of 246 from GenPept: >gplAAL23224.1|
(AE008906) affects pool of
3'-phosphoadenosine-5'-phosphosulfate in pathway of
sulfite synthesis [Salmonella typhimurium LT2]"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              /transl_table=11
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                                                                                                                                                                                                                                BCT 26-JUL-2002
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                        10083 GCGATTAAATTTGATATTGCCACACCCATTCGTGATAAGGATAACAGCAAAAATATTCAA 10024
                                                                                                                                                                                                                                                                                                                                                        Yersinia pestis KIM.
Yersinia pestis KIM
Bacteria; Proteobacteria; gamma subdivision; Enterobacteriaceae;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Direct Submission
Submitted (21-FEB-2002) Genetics, University of Wisconsin, 445
Henry Mall, Madison, WI 53706, USA
Location/Qualifiers
1. 10831
/organism="Yersinia pestis KIM"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Deng, W., Burland, V., Plunkett, G. III, Boutin, A., Mayhew, G.F., Liss, P., Perna, N.T., Rose, D.J., Mau, B., Zhou, S., Schwartz, D.C. Fetherston, J.D., Lindler, L.E., Brubaker, R.R., Plana, G.V., Straley, S.C., McDonough, K.A., Nilles, M.L., Matson, J.S., Blattner, F.R. and Perry, R.D. Genome Sequence of Yersinia pestis KIM
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Deng, W., Burland, V., Plunkett, G. III, Boutin, A., Mayhew, G.F., Liss, P., Perna, N.T., Rose, D.J., Mau, B., Zhou, S., Schwartz, D.C. Fetherston, J.D., Lindler, L.E., Brubaker, R.R., Plana, G.V., Straley, S.C., McDonough, K.A., Nilles, M.L., Matson, J.S., Blattner, F.R. and Perry, R.D.
                                                                                                                                                                                                                          p DNA linear BCT 26-JI
of 415 of the complete genome
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                                                                                                                                                                                                                     Yersinia pestis KIM section 68 o
AE013668 AE003952
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   /strain="KIM"
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247. .990
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complement(993. .1631)
                                                                                                  Db 10023 TTTTACATCGGACTTGGTACA 10003
                                                                        TrpHisIleSerLeuGlyThr 607
                                                                                                                                                                                                                                                                                                        AE013668.1 GI:21957368
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           /codon_start=1
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                /gene="cys0"
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                                                                                                                                                                                                                                                                                                                                                                                                                                                     (bases 1 to 10831)
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Yersinia.
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                                                                                                                                                                                                                                                  DEFINITION
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                                                                                                                                                                                                                                                                             ACCESSION
VERSION
KEYWORDS
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JOURNAL
PUBMED
REFERENCE
AUTHORS
                                                                        601
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JOURNAL
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                                                                                                                                                                          RESULT 16
                                                                                                                                                                                                                                                                                                                                                                                                                                                             REFERENCE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     AUTHORS
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                                                                                                                                                                                                  AE013668
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complement(2212. .3543)

complement(2212. .3543)

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(AE008906) putative hemolysin-related protein [Salmonella typhimurlum LT2]*

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LSGSVQIRSALIVPDTLTLSEALESFYRAGEDFAVILNEYARIVGITTLNDVMTTLMG
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CCTATICIGIGITITIGIGIGICIATIGCICCCACACCIATICGCCTATGCCCCCAATGIG 4805

4746

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'n

23

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ProThrAlaLeuLeuLeuProAlaLeuPhePhePheProHisAlaTyrAlaPro----

4866 ACAATT------GGCACTGATGAAGTTACCGCAGATGGCCGTTTTCGTTCA 4910

LeuPheLysAsnLysSerProAspThrGluSerValLysLeuLysProLysPheProVal

36

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ArgileAspThrGlnAspSerGluIleLysAspMetValGluGluH1sLeuProLeuIle 75

4911 CGGGTCGAT-----

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ThrGlnGlnGlnGluGluValLeuAspLysGluGlnThrGlyPheLeuAlaGluGluAla

---GAAGCTATTCGGCAGGGGCTGCGCGCATTAGGTTATTACGATCCCACCATTACGTTT 4976

ProAspAsnValLysThrMetLeuArgSerLysGlyTyrPheSerSerLysValSerLeu 115

GAATTACAAAACCGCCCGGCACCCCCCCCCTTCAGTTAATTGCAAAAGTGGTTCCTGGC 5036

ProArgThrLysIleAlaAsnValGlyValAlaIleLeuGlyAspIleLeuSerAspGly 149

130

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GAGCCGGTATTGATTGCCGGTGTCGATATCGTACTGCAAGGCGGTGCGGAAAACGGATCCT

116 ThrGluLysAsp------GlyAlaTyrThrValH1sIleThrProGly 129

5097 GAT------TATCAGGCACTCGTTCGCCGTGATACCCCGAAAATTGGCTCGGTC 5144

170 PheAspGlnAspSerTrpGluAsnSerLysThrSerValLeuGlyAlaValThrArgLys 189

150 AsnLeuAlaGluTyrTyrArgAsnAlaLeuGluAsnTrpGlnGlnProValGlySerAsp 169

5204

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FRRTDLADTWSDTTTLAVARRWDLSSGWQRAINLENSLIDHFTQGRYTDTTALLLYPGVS
INRTRORGGAMPVWGDSQRYSIDVSDTWGSDVDFGIFQAONVWIRTLGEKNRFVARG
VOWIETUNDFRVPPSLRFFAGGDRSTRGYKFRNISPRDSDGKLTGASKLATGSLEYQ
VOWIETUNDFRVPPSLRFFAGGDRSTRGYKFRNISPRDSDGKLTGASKLATGSLEYG
VOGFTIGLGPEL
GVQFTIGLGPEL
AGGT. 10384
AGT. 10384
6467. 10384
PAVISYQQLLQIFWENHDPAQGMRQGGDVGTQYRSAIYVLTPEQEEQAHKSRERFQQA
MEKAGDQRVITSEITVALPFYYAEDDHQQYLHKNPHGYCGLGGIGVCLPPNV"
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       /translation="MiryPilcFvclllatPlayaanvrLqvbgllsgdlbrnvrarLs
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PVLIAGVDIVLQGGAKTDPDYQALVRRDTPRIGSVLNHGDFDNFTSSLTGLALRRGYF
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VVVNTQAMPPTSSTPASTDFWGELSTPYPIFLRLLSLNNVKVTIDDTAISLDEFRTGA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      QLNLSGDADWRDISAWHARIAAKGNKLRYTIPPTARYDVSPDIVFEATPQLFTLNGSV
DIPWARITYQEVPETAVGVSSNEVMLNDQLQPIAPRSASIPISSNLVIRIGNDVRLNA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           NIEAIRNPDSTANGVIAGVRVTGMADSPRMEVPSDPAMSQQEALSYLLRGQGLGNSGA
DSSMMTSMLIGMGVAQSGKLVGKIGEAFGVSNLALDTQGVGDSSQVVVSGYVTKDLQI
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     DANMIKSQLGVAAQLHEAFWDIDFDSGQRYRFGKVIFQGSQIREDYLQNLVPFHEGEF
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   6467. 10384
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    KYGVGIFDSLATLTLRYRLMPRLYLEAVSGIDQALDLLYQFEF
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4734. .6470
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5501
                         -----CCGCGTCTGACCGCCAGTTGG 5594
                                                                                                             5265 GCGTTCTGGGATATTGATTTCGACAGTGGGCAACGTTACCGCTTTGGTAAGGTTATTTTC 5324
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                                                                                                                                                                                                                                                                                                   TyrSerGlyAlaSerValGlnAlaAspPhe---AspArgLeuGlnGlyAspArgValPro 288
 GlyTyrProLeuAlaLysLeuGlyAsnThrArgAlaAlaValAsnProAspThrAlaThr 209
                                                                                                                                                230 ThrGlyThrGlnArgTyrProGluGlnIleValSerGlyLeuAlaArgPheGlnProGly 249
                                                                                                                                                                                                                          250 ThrProTyrAspLeuAspLeuLeuLeuAspPheGlnGlnAlaLeuGluGlnAsnGlyHis 269
                                                                                                                                                                                                                                                                                                                                                                             ValLysValSerValThrGluValLysArgHisLysLeuGluThrGlyIleArgLeuAsp 308
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             TyrlleGlySerValValTrpAspMetAspLysTyrGluThrThrLeuAlaAlaGlylle 348
                                                                                                                                                                                                                                                  GAATTCTATACCTCTGAAGCTGGCCGAGTTGAACGCCCCCTTGGCAGCCAACTGG
                                                                                                                                                                                                                                                                                                                                                                                                                                                       SerGluTyrGlyLeuGlyGlyLysIleAlaTyrAspTyrTyrAsnLeuPheAsnLysGly
                                                                        210 ValAspLeuAsnValValValAspSerGlyArgProIleAlaPheGlyAspPheGluIle
                                                                                                                                                                                 CAAGGCTCACAA - - - ATCCGAGAGATTATCTGCAGAATTTAGTGCCGTTCCATGAGGGG
                                                                                                                                                                                                                                                                                                                                        TITAACTCGGTGGTTGTTTCGCCGGATTTCCAAGATGCCAAAGAGAGTAAAATTTTACCG
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                                     5205
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T. US-09-857-669-2 (1-609) x AE013668 (1-10831)

10831 152 92 262 161 21

Length:
Matches:
Conservative:
Mismatches:
Indels:

8.33e-15 366.50 36.58% 22.79%

Percent Similarity:
Best Local Similarity:
Query Match:
DB:

Alignment Scores: Pred. No.:

Score:

Bacteria; Proteobacteria; gamma subdivision; Enterobacteriaceae; Yersinia. 1 (bases 1 to 216050) Parkhill,J., Wren,B.W., Thomson,N.R., Titball,R.W., Holden,M.T.G., Prentice,M.B., Sebaihia,M., James,K.D., Churcher,C., Mungall,K.L., Baker,S., Basham,D., Bentley,S.D., Brooks,K., Cerdeno-Tarraga,A.M., Chillingworth,T., Cronin,A., Davies,R.M., Davis,P., Dougan,G., Feltwell,T., Hamlin,N., Holroyd,S., Jagels,K., Leather,S., Karlyshev,A.V., Moule,S., Oyston,P.C.F., Quall,M., Rutherford,K., Simmonds,M., Skelton,J., Stevens,K., Whitehead,S. and Barrell,B.G. Genome sequence of Yersinia pestis, the causative agent of plague Nature 413 (6855), 523-527 (2001)	21470413 11586360 2 (bases I to 216050) Parkhill, J. Direct Submission Submitted (04-0CT-2001) Submitted on behalf of the Yersinia sequencing team, Sanger Centre, Wellcome Trust Genome Campus, Hintton, Cambridge CB10 1SA E-mail: parkhill@sanger.ac.uk	Obtails of ORL, http://ork.	/gene="YPO3402" /note="panc" 86940 /gene="YPO3402" /EC_number="6.3.2.1" /EC_number="6.3.2.1" /note="similar to Escherichia coli pantoatebeta-alanine ligase Panto SW:PNAC_ECOLI (P31663) (283 aa) fasta scores: E(): 0, 72.0% id in 282 aa, and to Vibrio cholerae pantoatebeta-alanine ligase Vc0591 TR:09KUD1 (EMBL:AE004144) (293 aa) fasta scores: E(): 0, 59.0% id in 283 aa" /codon_start=1	/rishs_rable=11 /product="pantoatebeta-alanine ligase" /product="pantoatebeta-alanine ligase" /protein_da-"cAC92632.1" /db_xref="di-"cAC92632.1" /db_xref="di-15981329" /db_xref="gi-15981329" /db_xref="gi-15981329" /db_xref="gi-15981329" /db_xref="gi-15981329" /db_xref="gi-15981329" /db_xref="gi-18787" /ranslation="will beta-bender by Prt. Log DC BCKLTR HGADL L BCG HT L V DEGOTAL TR KWADWYUT IT V W PRETICATE BCG TEROTAL L R KWADWACH TRANDEAL SCRNGYT L BERGIDAL L BCG STRINGY TRANDEAL SCRNGY TRANDEAL SCR	13511731 /gene="YPO3403" /gene="YPO3403" /gene="YPO3403" /gene="YPO3403" /foct="%imilar to Escherichia coli aspartate /note="%imilar to Escherichia coli aspartate 1-decarboxylase precursor PanD SW:PAND_ECOLI (P31664) (126 aa) fasta soores: E(): 0, 78.6% id in 126 aa, and to Pseudomonas aeruginosa aspartate 1-decarboxylase precursor Pa4731 TR:AAG08117 (EMBL:AE004887) (126 aa) fasta scores: E(): 1.5e-27, 58.2% id in 122 aa" /codon_start=1 /transl_table=11 /product="aspartate 1-decarboxylase precursor" /protein_id="CAC92633.1" /db_xref="G1:15981330" /tb_xref="G1:15981330" /translation="MIRTMLQGKLHRVKYTQADLHYEGSCAIDQDFLEAAGILEVEAI
REFERENCE AUTHORS TITLE JOURNAL	MEDLINE PUBMED REFERENCE AUTHORS TITLE JOURNAL	FEATURES source	CDS	aene	CDS
349 SerGInProArgAsnTyrArgGlyAsnTyrTrpThrSerAsnValSerTyrAsnArgSer ::::: ::::::::::::::::::::::::::::::	Qy 404ArgLysIleProGlySerAspIleAspLeuGlyAsnSerHisAlaThrMet 420	5838 CGTTGGAGCCTCGATCACTTTACCCAAGGCAGAGTCACGGATACCACGATGTTGCTGTAT 455 SerSerthrAlaLeulleArgThrSerAlaArgAlaGlyTyr	0y 469 PhePherhrProGluAsnLysLysLeuGlyThrPheileile 482	0y 523 GlyProAsnGlySerValLeuProGluArgAlaLeuLeuValGlySerLeuGluTyrGln 542 :::	### ### ##############################

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complement(4167..5093)

Gene="YPO3406"

/gene="YPO3406"

/gene="YPO3406"

/note="Slmilar protein YadG SW:YADG_ECOLI

transporter ATP-binding protein YadG SW:YADG_ECOLI

(P36879) (308 aa) fasta scores: E(): 0, 81.8% id in 308

aa, and to vibrio cholerae ABC transporter ATP-binding

protein Vc0589 TR:Q9KUD3 (EMBL.AE004144) (305 aa) fasta

scores: E(): 0, 71.4% id in 304 aa"

/rransl_table=11

/product="putative ABC transporter, ATP-binding protein"

/protein_d="Cac926351"

/db_xref="G1:15981333"

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DEPTAGVDERRSWMGFLKELNAQGTIILTHYLEEAEMLCRNIGIIQNGELVENT
TMKQDLSKLESETFIPDLGAKSPLPKLEGYGYRLTDTSTLEVDVKREQGLNSLFSQLN
VQGVQVQSMRNKANRLEEELFYTLVNGHEGEKA"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Db 137007 CCTATTCTGTGTTTTGTGTGTCTATTGCTCGCCACACCTATGGCCTATGCCGCAATGTG 136948
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Db 136887 ACAATT------GGCACTGATGAAGTTACCGCAGATGCCGTTTTCGTTCA 136843
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Db 136842 CGGGTCGAT----- 136834
                                                                          transmembrane helices predicted
                                                                                                                                                                          transmembrane helices predicted
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     /note**PS00017 ATP/GTP-binding site motif A (P-loop)." 5329, .5991
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         -----AlaAlaAspLeuSerGluAsnLysAlaAlaGlyPheAla 35
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         ABC transporters family signature."
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        56 ArglleAspThrGlnAspSerGlulleLysAspMetValGluGluHisLeuProLeuIle
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           LeuPheLysAsnLysSerProAspThrGluSerValLysLeuLysProLysPheProVal
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     /note="Pfam match to entry PF00005 ABC_tran, ABC transporter; score 198.80, E-value 8.5e-56" complement(4641. 4685) /gene="YP03406"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          5 ProThrAlaLeuLeuLeuProAlaLeuPhePhePheProHisAlaTyrAlaPro---
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152
92
262
161
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Mismatches:
Indels:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Matches:
                                                                                                                      complement(4045, .4110)
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/note="one of 6 probable
for YPO3405 by TMHMM2.0"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Length:
                                                                     /note one of 6 probable
for YPO3405 by TMHMM2.0"
  or YPO3405 by TMHMM2.0"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         US-09-857-669-2 (1-609) x AJ414157 (1-216050)
                                                                                                                                                                                                                 complement(4167, 5093)
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Gaps:
                         complement(3919, .3984)
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    /note="PS00211 ABC tran
complement(4959, 4982)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   /gene="YPO3406"
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5329. .5991
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   366.50
36.58%
22.79%
11.55%
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Best Local Similarity:
Query Match:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Percent Similarity:
                            misc_feature
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COMPLEMENT(3409 . 4164)
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1331. 1698
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AENLRYPIVGKLKDRLSNTWYQVNIGDRLGYVSSADAEIDNGIPILTYHHMLKNEENK
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   RFLNTSTTTSDVAFSNQMAYLKQAGYDTISLYQLEGYLNNKINLPAKVVVLTFDDGLK
SVRYAYDILKENGFRATAFILSSKIKRHPQKWNDSLACEMSTAELKGEODVFDTQSH
THFLHRTDINBHHPILLSRSYHNITPDFERSRRALAQRNPHVTFLSYPFGGFNQTAVNA
AKNAGFHLAVTTWQGKVKPGDNPYTLKRLYILRTDSIPTMAERIANQPGPVAVKPAPA
                                                                                                                                                                                                                                             /note="Similar to Escherichia coli hypothetical protein
YadE SW:YADE_ECOLI (P31666) (409 aa) fasta scores: E(): 0,
65.4% id in 382 aa"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 /note="Similar to Escherichia coli hypothetical 28.5 kDa
protein in hpt-panD intergenic region YadH SW:YADH_ECCLI
(P36880) (256 aa) fasta scores: E(): 0, 80.1% id in 256
aa, and to Vibrio cholerae putative permease Vc0590
TR:QSKUDZ (EMBL.AE004144) (256 aa) fasta scores: E(): 0,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          type transporter, score -22.30, E-value 5.8e-05" complement(A427, .3492)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      transmembrane helices predicted
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protein"
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                                                                                                                                                                                                                                                                                                                                                               /product."conserved hypothetical protein"
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  membrane proteins signature." complement(3592, .3657)
                                                                                                                                                                                                                                                                                                                                                                                                                                                    /db_xref-"SPTREMBL:Q8ZBK5"
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for YPO3405 by TMHMM2.0"
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             /note-"one of 6 probable
for YPO3405 by TMHMM.0"
complement(3679, .3744)
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                                                                                                                                                                                               complement(1880. .3073)
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                                                   misc_feature
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75

ò	16	ThrGlnGlnGlnGluGluValLeuAspLvsGluGlnThrGlvPheLenAlaGluAla 95	Оу 421
7 6	13683		Db 135966 GTTG
3 8		The state of the s	Oy 435 HisP
Š €	136833	FromspanidativistinmerLeuarigestLysciy:YrPrheberserLysvalserLeu ilb ::::::::::::::::::::::::::::::::::::	Db 135915 CGTT
ô	116	ThrGluLvsAspGlvAlaTvrThrValHislleThrProGlv	Qy 455 SerS
q	136776		135
δ	130	ProArgThrLysIleAlaAsnValGlyValAlalleLeuGlyAspIleLeuSerAspGly 149	Oy 468 DD 135795 AGCC
a	136	GAGCCGGTATTGATTGCCGGTGTCGATATCGTACTGCAAGGCGGTGCGAAAACGGATCCT	469
් සි	150	AsnLeualaGluTyrTyrArgAsnAlaLeuGluAsnTrpGlnGlnProValGlySerAsp 169 iii	135735
ογ		170 PheAspGlnAspSerTrpGluAsnSerLysThrSerValLeuGlyAlaValThrArgLys 189	Qy 483 ArgG Db 135675 CGTG
a	136608	CTCAACCATGGTGATTTTGATAATTTCACCAGTTCTTTACTGGTTTAGCGTTACGCCGT	
oy G		190 GlyTyrProLeuAlaLysLeuGlyAsnThr.ArgalaAlasnProAspThrAlaThr 209 1111111	
δ		ValValAspSerGly	523
q	136488	GCGTTCTGGGATATTGATTTCG	130000
Q Q		230 ThrGlyThrGlnArgTyrProGluGlnIleValSerGlyLeuAlaArgPheGlnProGly 249	Oy 543 Leur Db 135495 TATA
ò	250		Qy 563 AsnP
g Q	136		135435
0y	270	TyrSerGlyAlaSerValGlnAlaAspPheAspArgLeuGlnGlyAspArgValPro 288	583
QQ	136311		1353/5
ò		ValLysValSerValThrGluValLysArgHisLysLeuGluThrGly :::	QY 600 Argr :::: Db 135315 CAAT
g G	136251	CTTGATGCGGTCC	RESULT 18
oy Op	309	SerGluTyrGlyLeuGlyGlyLysIleAlaTyrAspTyrTyrAsnLeuPheAsnLysGly 328 	AE008906 LOCUS AE
Qy	329	TyrileGlySerValValTrpAspMetAspLysTyrGluThrThrLeuAlaAlaGlyIle 348	GE ACCESSION AE
ф	136185	GTCGGT	SO
δ		SerGhnProArgAsnTyrArgGlyAsnTyrTrpThrSerasnValSerTyrAsnArgSer ::::111	SOURCE ORGANISM Sa Ba
음	136158	CGTAAGCCTTGGATGAACTCCTTCGGGCATAACC 136120	
S G	369	ThrThrGlnAsnLeuGluLysArgAlaPheSerGlyGlyIleTrpTyr	AUTHORS MC La La
òé	Oy 385	ValargaspargalaGlyIleAspalaArgLeuGlyAlaGluPheLeuAlaGluGly 403 	Gr St TITLE CO
ò	404		
검	136017	Db 136017 TTAGACGTACCGACTTAAACGACACTAATTCAGATACCACGACCTTGAAC 135967	

õ	421	euAsnAs
q	135966	GTTGCACGTTTTTGGGATCTCTCCAGCGCTGGCAAAGGCGCGATTAACCTG 135916
Οŷ	435	HisproGluAsnGlyHisTyrLeuAspGlyLysIleGlyThrThrLeuGlyThrPheLeu 454
Q	135915	CGTTGGAGCCTCGATCACTTTACCCAAGGCAGAGTCACGGATACCACGATGTTGCTGTAT 135856
δ	455	SerSerThralaLeuIleargThrSerAlaArgAlaGlyTyr
qΩ	135855	CCGGGGGTGACTATTAATCGTACCCGCCAACGTGGGGGGGG
QY	468	468
qq	135795	AGCCAGCGCTATTCTATTGATGTGTCTGATACGACTTGGGGGTCGGATGTTGATTTTGGC 135736
δ	469	PhePheThrProGluAsnLysLysLeuGlyThrPheIleIle 482
qq	135735	ATCTTTCAGGGGGAGAGGTGTGGATCCGGACCTTAGGTGAAAAATCGTTTTGTGGGG 135676
Οy	48	ArgGlyGlnalaGlyTyrThrValAlaArgAspAsnAlaAspValProSerGlyLeuMet 502
Q	135675	CGIGGCAAIGIGGGIGGAICGAAACCAAIAAIIIIGACCGIGTICCACCGICGCIGCGI 135616
oy S	,	2 1
3 6	TOCCT	
2 5	13555	GTYFIOSHGIYGEIVALDEUFIGGIUM GATAGLEGUZEUVATGIYGEIGITTITITITITITITITITITITITITITITITITI
Ĉ	2	5,62
3 8	13549	TATAACTTCACGGTACATGGTGGGGGCCCTTTTCGTCGATTCGGCGGGGGCGGTGAAT
ŏ	56	582
og G	135	
QY	, 583	LeuAlaProPheSerPheAspIleAlaTyrGlyHisSerAspLysLysIle 599
q	135375	:::
οy	009 /	ArgTrpHislleSerLeuGly 606
QQ	135315	:::::::
A A E	RESULT 18 AE008906 LOCUS DEFINITION	_
A VE	ACCESSION VERSION KEYWORDS	genome. AE008906 AE006468 AE008906.1 GI:16422950
SS	OURCE ORGANISM	
R	REFERENCE AUTHORS	
	6 E E	
		CIPATION OF THE PROPERTY OF TH
	JOURNAL MEDLINE PUBMED	Nature 413 (6858), 852-856 (2001) 21534948 11677609
R	REFERENCE AUTHORS	

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/note-"similar to E. coli 30S ribosomal subunit protein S6 (AAC77157.1); Blastp hit to AAC77157.1 (131 aa), 99% identity in aa 1 - 131"
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                                                                                                                                                                                                                                                                                                                                                                                                                                       /translation="wrhyelvpmvhpdoseovpgmierysaaitgaegkihkledwgr
RQLAYPINKLHKAHYVLMNVEAPQEVIDELETTFRFNDAVIRSMVMRTKHAVTEASPM
VKAKDERRERRDDFANETADDAEAGDSEE"
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          /Lranslation="MTNRLALSGTVCRAPLRKVSPSGIPHCQFVLEHRSVQEEAGFHR
QAWCQMPVIVSGHENQAITHSITVGSRITVQGFISCHKAKNGLSKMVLHAEQIELIDS
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/translation="karyfrrrkcrfrtargroweidykdiatiknyitesgkivpsri
rgtrakygrolrratkrarylislipytdrig"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    (AAC77158.1): Blastp hit to AAC77158.1 (104 aa), 99% identity in aa 1 - 104"
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1562. 1789
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1243. 1557
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/product="30S ribosomal subunit protein S18"
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2417. .2422
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/gene="priB"
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/gene="rpsR"
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/gene="y1f2"
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| Comparison | Cocation/Qualifiers | C
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complement(378. .383)
/gene="Yjfy"
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NNCTITLSLPAGASIITRHFSADL"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               The analyses of ribosome binding sites and promoter binding sites were kindly provided by Heladia Salgado, Julio Collado-Vides and ReguonDB;
http://kinich.cifn.unam.mx:8850/db/regulondb_intro.frameset
                                                                                                                                                                                                                                                                Coding sequences below are predicted from manually evaluated computer analysis, using similarity information and the programs; GLIMMER; http://www.igia.org/softiab/glimmer/glimmer.html and GeneMark; http://opal.biology.gatech.edu/GeneMark/
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                EC numbers were kindly provided by Junko Yabuzaki and the Kyoto Encyclopedia of Genes and Genomes; http://www.genome.ad.jp/kegg/,and Pedro Romero and Peter Karp at EccCyc; http://ecccyc.pangeaSystems.com/ecccyc/c/
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564. .770
Direct Submission
Submitted (29-MAR-2001) Genome Sequencing Center, Department of
Genetics, Washington University School of Medicine, 4444 Forest
Park Boulevard, St. Louis, MO 63108, USA
COMMENT Supported by NIH grant 50 01 A143283
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560. .770
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/note="LT2"
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560. .565
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/gene="STM4390"
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17288 TATTTCTGCGCGGGAACAG--------GTGCTGGATTTTAGTTATAAAAT 17329
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              17387 TACCGATTTGAATGATACGGAGCAGGACTCGACCACGCTTGCCGTGTCGCGTTACTGGGA 17446
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                17447 CCTTTCCAGTGGTTGGCAGCGGGCGATT-----AATCTGCGCTGGAGTTTCGACCA 17497
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   17498 CTTTACCCAGGGGAACGTCACCAATACCACCATGCTGTTCTACCCGGGCGTGATGATCAG 17557
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              17618 AGACTATTCGAATACGGCCTGGGGCTCCGACGTGGATTTCTCCGTGCTGCAGGCGCAAAA 17677
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                                      TCAGGCGTTTTGGGATATTGATTATGATAGCGGTGAGCGCTATCGCTTCGGACCTGTCAC 16963
                                                                                              sGlyTyrIleGlySerValValTrpAspMetAspLysTyrGluThrThrLeuAlaAlaGl 347
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  347 yIleSerGlnProArgAsnTyrArgGlyAsnTyrTrpThrSerAsnValSerTyrAsnAr 367
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       aThrValAspLeuAsnValValValAspSerGlyArgProIleAlaPheGlyAspPheGl 228
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                                                                        ulleThrGlyThrGlnArgTyrProGluGlnIleValSerGlyLeuAlaArgPheGlnPr
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/product="putative permease"
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/note="STM4396"
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note="putative RBS for yifz; RegulonDB:STMS1H004280" 3354
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                75 IleThrGlnGlnGlnGluGluValLeuAspLysGluGlnThrGlyPheLeuAlaGluGlu 94
                                                    /note="similar to E. coli orf, hypothetical protein fa774606.1); Blastp hit to AAC74606.1 (266 aa), 25% identity in aa 20 - 250" /codon_start=1
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          55 ValArglleAspThrGlnAspSerGluIleLysAspMetValGluGluHisLeuProLeu 74
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protein A"
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                                                                                                                                                                                                                                                                                                                                                                                     /note="similar to E. coll orf, hypothetical (AAC77163.1); Blastp hit to AAC77163.1 (224 identity in aa 13 - 224"
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Matches:
Conservative:
Mismatches:
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/gene="ytf8"
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Salmonella.

(bases 1 to 249050)

Parkhill, J., Dougan, G., James, K.D., Thomson, N.R., Pickard, D.,
Wain, J., Churcher, C., Mungall, K.L., Bentley, S.D., Holden, M.T. G.,
Sebahlia, M., Baker, S., Basham, D., Brooks, K., Chillingworth, T.,
Connerton, P., Croolin, A., Davis, P., Davies, R.M., Dowd, L., White, N.,
Farrer, J., Feltwell, T., Hamlin, N., Haque, A., Hien, T.T., Holroyd, S.,
Parry, C., Qualli, M., Rutherford, K. Simmonds, M., Skelton, J.,
Stevens, K., Whitehead, S. and Barrell, B.G.
Complete genome sequence of a multiple drug resistant Salmonella
enterfoa serovar Typhl CT18

L. Nature 413 (6858), 848-852 (2001)
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(URL, http://www.sanger.ac.uk/Projects/S_typhi/).

Location/Qualifiers
1. 249050
/organism="Salmonella enterica subsp. enterica serovar Typhi
                                                                                                                                                                                                                                                                                                                                                                                                     Salmonella enterica serovar Typhi (Salmonella typhi) strain CT18, accomplete chromosome: segment 19/20.
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Salmonella enterica subsp. enterica serovar Typhi
Bacteria; Proteobacteria; gamma subdivision; Enterobacteriaceae;
                                                                                                                                                        17858 TAAAGGCGCCTCAAAACTGGCAACCGGATCGCTGGAGTACCAGTATAACGTCACGGTAA 17917
                                                                          18038 CGATTTTGCCGTACCGGTCGGCGACAAGACGAACACGGTTTACAGTTTTATATATCGCGTCT 18097
528 lLeuProGluArgAlaLeuLeuValGlySerLeuGluTyrGlnLeuProPheThrArgTh 548
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Submitted (25-CCT-2001) Submitted on behalf of the Salmonalla sequencing team, Sanger Centre, Wellcome Trust Genome Campus, Hinxton, Cambridge CBIO 1SA, UK
                                                                                                                                                                                                                                        eAsplleAlaTyrGlyHisSerAspLysLys-----IleArgTrpHisIleSerLe
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/db_xref="SPTREMBL:0821H0"
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/codon rt:
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/gene="STY4596"
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/Note-"Similar to Salmonella typhimurium cryptic 60-MDa plasmid SamB protein SW:SAMB_SALTY (P23822) (424 aa) fasta scores: E(): 0, 89.6% id in 423 aa, and to Shigella flexneri impB impB TR:092A91 (EMBL:AR079316) (423 aa) fasta scores: E(): 0, 71.7% id in 421 aa paralogue of E. coli umuc (UMUC_ECOLI); Fasta hit to UMUC_ECOLI (422 aa), 63% identity in 420 aa overlap"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    MFLDVRNIDSCIDFEDFGRQLREHVHSGTGLTIGVGMGPTKTLAKSADWASKEWROFE
GVLALTSCHWEKTEKLLSLQPVDETBGVGRETSKLHTMGTTALQLARANPFITRN
GVLALTSCHWEKTEKLLSLQPVDETBGVGRETSKLHTMGTTTALQLARANPFITRN
FSVYLERTVRELNGESCIBEADPPRQOIVCSRSFGERVTYPEAMRQAVCGYABRAA
EKLRGEROFCHHVAVPVKTSPRAVNEPYTGUNASEKLTTPPTQDTRDITAANKALDRI
WVKGHRYAKAGCMLNDFTPTGISQLNLFDEVQPHERSEQLMKVLDSINHSGMGKVWFA
complement (695. 1741)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      /pseudo
complement(join(1753. .1830,35386. .35730))
/gene="STY4598"
/FC_number="3.4.21.-"
/Ante="Similar to Salmonella typhimurium SamA protein samA
SW:SAMA_SALTY (P23831) (140 aa) fasta scores: E(): 0,
82.1% id in 140 aa, and to Salmonella typhimurium ImpA
Protein impA SW:IMPA_SALTY (P1884) (145 aa) fasta scores:
E(): 1.5e-31, 64.2% id in 123 aa. This CDS has been
interrupted by the insertion of a bacterlophage"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 /translation="MNKPLIALLITSFSASADKIPSSIQNLIAVYDTRTHSLEDGGL
TIRYNKRLILVDAAESMFQGICNDYYMNKWRPGTIKRITLLNVTSDQFEINAGGDEC
RKAGTMKNDEQARTYRTSFIKPLQ"
complement(2437 . .2655)
/gene="STY4600"
complement(2437 . .2655)
/translation="MRINVLLLTSLLVAGPALAGEAHVCKSOTVANSAANAELTDNTV FKCGESISGTIPSLAREGWKIVQQTDQADVTDPSKTVAQLIIQKD" complement(479. .1753) /gene="STY4597"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   /transl_table=11
/poduct="UV protection protein"
/protein_id="AD06719_1"
/db_xref="d1:16505372"
/db_xref="SPTREMBL:0811G9"
/translation="MRALDO87VAFXSCEKVFRPDLRNTPVVVLSNNDGCVIARSKEA
/translation="MRALDO87VAFXSCEKVFRPDLRNTPVVVLSNNDGCVIARSKEA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      /pg.me-"Pfam match to entry PF00817 1MS, impB/mucB/samB
family, score 545.70, E-value 3.1e-160"
complement(join(1753. .1830,35386. .35730))
/gene-"STV4598"
/note-"samA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                /transl_table=11
/product="UV protection protein (pseudogene)"
/db_xref="PSEUDO:CAD06720.1"
/db_xref="REMTREMBL:CAD06720"
1831. .1839
/note="phage insertion point. Note this sequence is duplicated at position 4507385. .4507393"
1840. .35385
/note="bacteriophage"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              13
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        /product-"hypothetical protein"
/protein_id="CAD06721.1"
/bxref="G1:16505373"
/db_xref="SPTREMBL:0821G8"
                                                                                                                                                            complement(479. .1753)
/gene="STY4597"
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/gene="STY4599"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 1973. .2350
/gene="STY4599"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       /codon_start=1
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                                                                                                                                  /note="samB
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/db_xref="STTREMEL:0821G6"
/translation="WNFSSDLFGLNSRSPAFSITIEGKDVTFALDARLMSLTLTDNRG
/translation="WNFSSDLFGLNSRSPAFSITIEGKDVTFALDARLMSLTLTDNRG
FEADCIDLELDDADGQIVLPRRGANIOTUGEKWGQPLFPKGFFTVDEIEHSGAPDRLT
IRABSAPFRETLNYFREESKHQTTVGEVKETAARHNIKVALGKDLTDRVLVLDHWDQTN
ESDASFLMKLARQYGAIASYKDGNLLFIRGGGGRTASGKPLFVITITRKAGDGHRFTL
ADRGAYTGVIASWHLTREPKKKFTTOVKRRHKKVATPKEPEAKGGDYLVGTDENVLVL
NRTYANRGNAERAARMQWBRLQRGVASFSLQLAEGRADLYTEMPVKVSGFKQPIDDAE
GOMDIEMENL(31820. .4305)
/gene="STY4602"
/gene="STY4602"
/note="Sinilar to Bacteriophage P2 complete genome U
essential tail protein TR:064315 (EMBL:AF063097) (159 aa)
fasta scores: E(): 2.2e-26, 45.2% id in 157 aa and
Bacteriophage 186 protein F TR:080317 (EMBL:U31222) (161
aa) fasta scores: E(): 1.1e-29, 49.1% id in 159 aa."
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  /gene="STY601"
/force="Similar to Bacteriophage P2 late gene control protein D SW:VPD_BPP2 (P10312) (387 aa) fasta scores: E(): 0, 54.38 id in 370 aa and to Bacteriophage 186 late gene control protein D SW:VPD_BP186 (P21679) (389 aa) fasta scores: E(): 0, 54.7% id in 371 aa"
//codon_start=1
//transl_table=11
//product-putative regulator of late gene expression"
//potect=-putative regulator of late gene expression"
//db_xref="G1:16506375"
/note-"Similar to Escherichia coli prophage P2 Ogr protein SW:OGRK_ECOLI () (72 aa) fasta scores: E(): 4.8e-15, 55.7% id in 70 aa and to Bacteriophage 186 late gene control protein B SW:PBE BP186 (P08711) (72 aa) fasta scores: E(): 2.1e-17, 64.2% id in 67 aa."
                                                                                                                                                                                                                                                                                                               /protein_id="CAD06722.1"
/db_xref="G1:1656334"
/db_xref="SpTREMBL:08137"
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VVRFTVTPALVNNAPHPTVSGQGHNNF"
/gooplement(2723. .3823)
complement(2723. .3823)
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/translation-"MAMYLGLYVEMENTPYOELQYQRSWRHAANSRVNRRPSTQFLG
PDNDPLTLSGVLLPBYTGGRLSLLALEQMAELGRAWPLIEGSGTIYGHEVIESLSQTR
TEFFESGMSRRIEFTLTLKRVDESLSDMFGSLSDQLSNLQDSATSAIGNIKNTVGGLL
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/translation-"MSDNNLRLQVVLGAVDKITRPFKNAQAGSKELASAIRQTRDQIK
KLSDAGGGIKSFPOLTGSVSRFAGELDQARELRAQMWTREMSSLESPPKKQTQALEAQW
RAVSRLEGOKOQOETROMAAARAELYRLGLSAGGGARETARIAREFERYNRQLARDERR
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/note="Similar to Bacteriophage 186 protein G TR:Q37848
[EMBL:23222] (812 aa) fasta scores: E(): 1.4e-14, 24.5%
                                                                                                                                                                                                                                                         /product="putative positive regulator of late gene
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          /transl_table=11
/product="putative phage tail protein"
/protein_id="CAD06724.1"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     /product-"hypothetical protein"
/protein_id="CAD06725.1"
/db_xref="GI:16505377"
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/transl_table=11
                                                                                                                                                                                       /codon_start=1
/transl_table=11
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                                                                                                                                                                                                                                                                                             transcription
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gene

gene CDS LREVGERORKLNAIKAKAEKTRELRNSLAGNGAGAMAAGVTTGMTLLAPVKAYSESEN

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LGGLGESAAYLGVOLQMAPTAAAEFAAKLQDATQTSEKDMMNLMDV1QKGFYAGVDSG
NMLQGFSKISSAMNIINKKGLBAVKTFAPLLVMADQGSWAGBSAGNAYRKIFQAALDA
AANQLAGSMMGPGGKVAPEFEKINRLAVALGDKLPGTTADFQNMMTMLRRQGMSAQVI
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Alignment Scores:

.. 0N

gene

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153683 TCAGGCGTTTTGGGATATTGATTATGATAGGCGGTGGGGGGCGTATCGCTTCGGGCCTGTCAC 153742
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                                                                                                                                                                                                                                                                                            C-----AAAGATTATCTG-----GCCTTACTGAAAACGCGTCCGGCAATCGGCAC 153562
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     153563 GGTGCTCAACCAGGGGGACTATGACAATTTTAAAAAGTCGTTAACCAGGGTGTCGCTACG 153622
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   153623 CAAAGGCTATTTCGACAGCGAATTCATTAAAAGTCAGTTGGGAATTGCTCTGGGCCGTCA 153682
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         153743 CTTCGAAGGTTCGCAG---ATTCGTGATGAATATTTACAAAATCTGTTGCCGTTTAAAGA 153799
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  153800 GGGTGATGAGTACGAATCGAAAGATTTGGCGGAACTAAACCGCCGCCGTTTCCGCTACCGG 153859
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                ATGGTTTAATTCTGTTGTGGTGGCGCCGGAATTTGAGAAATCGCGTAAAACAAAATTCT 153919
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Db 154022 ACCGTGGATGAACTCCTAC-------GTCATAGCCTGACCACCACCACGAG 154066
                                                                                                                                                                                                                                                                                                                                                                                                                                                                           153399 TTCGACTTGCTTCCACCGCCTGCGAAAGACGCCGCTATTA-ATCGCCAGGGTTACGCC 153457
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         oGlyProArgThrLysIleAlaAsnValGlyValAlaIleLeuGlyAspIleLeuSerAs 148
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            ulleThrGlyThrGlnArgTyrProGluGlnIleValSerGlyLeuAlaArgPheGlnPr 248
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      288 -ProValLysValSerValThrGluValLysArgHisLysLeuGluThrGlyIleArgLe 307
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 pGlyAsnLeuAlaGluTyrTyrArgAsnAlaLeuGluAsnTrpGlnGlnProValGlySe 168
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        uAspSerGluTyrGlyLeuGlyGlyLysIleAlaTyrAspTyrTyrAsnLeuPheAsnLy 327
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          yHisTyrSerGlyAlaSerValGlnAlaAspPheAspArgLeuGlnGlyAspArgVal--
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      sGlyTyr11eGlySerValValTrpAspMetAspLysTyrGluThrThrLeuAlaAlaGl
                                                                                                                                                                                     55 ValArg1leAspThrGlnAspSerGluIleLysAspMetValGluGluHisLeuProLeu
                                                                                                                                                                                                                                                                     75 IleThrGlnGlnGlnGluGluValLeuAspLysGluGlnThrGlyPheLeuAlaGluGlu
                                                                                                                                                                                                                                                                                                                                                   95 AlaProAspAsnValLysThrMetLeuArgSerLysGlyTyrPheSerSerLysValSer
                                                                                                                                                                                                                                                                                                                                                                                                                                     Leu-Thr---------GluLysAspGlyAlaTyrThrVal---HisIleThrPr
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               rAspPheAspGlnAspSerTrpGluAsnSerLysThrSerValLeuGlyAlaValThrAr
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             gLysGlyTyrProLeuAlaLysLeuGlyAsnThrArgAlaAlaValAsnProAspThrAl
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    249050
139
99
262
103
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                         Matches:
Conservative:
Mismatches:
                                                                                      Indels:
                                                                                                                                               US-09-857-669-2 (1-609) x AL627283 (1-249050)
2.22e-12
357.00
39.53%
23.09%
                                                                 Best Local Similarity:
                                            Percent Similarity:
                                                                                  Query Match:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              208
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154337 CCGAACCGCTCGCGAGGGGGATGCCAACCTGGGGGGGTTCGCAGCGCTACTCGGT 154396
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                                                                                                                                                                                                                                                                                                                                                                                      AGACTATTCGAATACGGCCTGGGGCTCCGACGTGGATTTCTCCGTACTGCAGGCGCAAAA 154456
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                                                                                                                                                             sIleProGlySerAspIleAsp------LeuGlyAsnSerHisAlaThrMe 420
                                                                                                                                                                                                                                                               sTyrLeuAspGlyLysIleGlyThrThrLeuGlyThrPheLeuSerSerThrAlaLeuIl 460
          ylleSerGlnProArgAsnTyrArgGlyAsnTyrTrpThrSerAsnValSerTyrAsnAr 367
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                                                           gSerThrThrGlnAsnLeuGluLysArgAlaPheSerGlyGlyIleTrpTyrValArgAs
                                                                                                           pArgAlaGlyIleAspAlaArgLeuGlyAlaGluPheLeuAlaGluGly----ArgLy
                                                                                                                                                                                                                                                                                                               eArgThrSerAlaArgAlaGly------TyrPhePh
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Haemophilus influenzae.
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1 (bases 1 to 1731)
Ruelle, J. L. and Thonnard, J.
Ruelle, J. L. and Thonnard, J.
Haemophilus influenzae rd outer membrane sequences used as vaccine
Patent: WO 0047737-A 3 17-AUG-2000;
RUELLE JEAN LOUIS (BE); SMITHKLINE BEECHAM BIOLOG (BE); THONNARD
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    TyrTyrArgAsnAlaLeuGluAsnTrpGlnGlnProValGlySerAspPheAspGlnAsp 173
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     ACTIACGATGATTACAAAACAGCGATTTCACGCTTGGCATTAAATCGTGGGTATTTTGAT 480
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            AlaLysLeuGlyAsnThrArgAlaAlaValAsnProAspThrAlaThrValAspLeuAsn 213
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          VallysThrMetLeuArgSerLysGlyTyrPheSerSerLysValSerLeuThrGluLys 118
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 IlealaAsnValGlyValAlaIleLeuGlyAspIleLeuSerAspGlyAsnLeuAlaGlu 153
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        174 SerTrpGluAsnSerLysThrSerValLeuGlyAlaValThrArgLysGlyTyrProLeu 193
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             145 AAAGAAGAAATGGACGGGTCTGAACGCTATCAGCATTTGGTAACCAAAGCCGTGGATCGT 204
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              ---ATCCGTGACGATTATCTCAATAATATTCTTAACATCAAATCTGGCGATCCATATTA 657
Haemophilus influenzae
Bacteria; Proteobacteria; gamma subdivision; Pasteurellaceae;
Haemophilus.
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### GGGAACTTTAAAATTTAGAAATCAGCCTGAAAACCATCAAGCATGGTGGCGA
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238
129
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/organism="Haemophilus influenzae"
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a 322 c 386 g 514 t
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Matches:
Conservative:
Mismatches:
Indels:
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355.50
38.01%
23.31%
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                                                               REFERENCE
                                                                                     AUTHORS
                                                                                                                                  JOURNAL
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AE004323 14390 bp DNA linear BCT 31-JUL-2000 I Vibrio cholerae chromosome I, section 231 of 251 of the complete AE004323 AE004323 AE004323.1 GI:9657119	Vibrio Vibrio Bacterio 1 (bas Heidelb Dodson, Gill, S.	Sellers, P., McDonald, L., Utterback, T., Fleishmann, R.D., Nierman, W.C. and White, O. DNA sequence of both chromosomes of the cholera pathogen Vibrio cholerae Nature 406 (6795), 477-483 (2000) 20406833 10952301 2 (bases 1 to 14390) 2 (bases 1 to 14390) Heidelberg, J.F., Eisen, J.A., Nelson, W.C., Clayton, R.A., Gwinn, M.L.,	Gill,S.R., Nelson,K.E., Rea Ermolaeva, M.D., Vanathevan, Sellers,P., McDonald,L., UI Nierman,W.C., White,O., Sal Meklanos,J.J., Venter,J.C. Direct Submission Submitted (14-JUN-2000) The Medical Center Dr. Rockvill Medical Conter Dr. Rockvill 1. 14390	/organism="Vibrio cholerae" /strain="N16961" /strain="N16961" /serotype="01" /db_xref="taxon:666" /chromosome="1" /note="blotype: El Tor" 80661 /gene="vC2536" /gene="vC2536" /chote="identified by Glimmer2; putative" /rons tahle=11	/product_*conserved hypothetical protein* /product_*conserved hypothetical protein* /productin_id=*AaF95677.1* /db_xref=*G1:9657120* /db_xref=*G1:9657120* /translation=*MakNAARNAARNOKAPWEEEEIIWVSRTELKNDMLALOKLGEELVE /translation=*MakNAARNAARNOKAPWEEEEIIWVSRTELKNDMLALOKLGEELVE /translation=*MakNAARNAARNOKAPWEEEEIIWVSRTELKNDMLALOKLGEELVE /translation=*MakNAARNAARNOKAPWEEEEIIWVSRTELKNDMLALOKLGEELVE /translation=*MakNAARNOKAPWEEEEIIWVSRTELKNDMLALOKLGEELVE /translation=*MakNAARNOKAPWEEEEIIWVSRTELKNDMLALOKLGEELVE /translation=*MakNAARNOKAPWEEEEIIWVSRTELKNDMLALOKLGEELVE /complement(f641498) /gene=*WC2537* /note=*Similar to GB:D10483 SP:P31548 PID:216486 GB:U00096 PID:1786233; dentified by sequence similarity; putative* /codon start=*MakNAARNOKAPWEEEEIIWVSRTELKNDMLALOKLGEELVE /codon start=*MakNAARNOKAPWEEEEIIWVSRTELKNDMLALOKLGEELVE /translation=*MakNAARNOKAPWEEEEIIWVSRTELKNDMLALOKLGEELVE /translation=*MakNAARNOKAPWEEEEIIWVSRTELKNDMLALOKLGEELVE /translation=*MakNAARNOKAPWEEEEIIWVSRTELKNDMLALOKLGEELVE /db.************************************	/transl_table=11 /product="thiamine ABC transporter, ATP-binding protein, putative" /protein.id="AAF95678.1" /db_xref="G1:9657121" /db_xraf="G1:9657121" /tbslvAGFIEPVSGSIKVNDGSVLGLAPYQRPFSMLFGEHULFAHLTVRENIGLGL HPGLKLNAEQKQQVVDAAQVGIADYLDERLEPGLSGGGGGRVALARCEVQPRPHILDERLEPGLSGGGAVALARCEVQPRPHILDERLEPGLSGGGAVALARCEVQPRPHILDERLEPGLSGGAVTAQHPHPELAQFVAAALNEPK"
RESULT 21 AE004323/C LOCUS DEFINITION ACCESSION VERSION VERSION SETWORDS	ORGANISM REFERENCE AUTHORS	TITLE JOURNAL MEDLINE PUBMED REFERENCE AUTHORS	TITLE JOURNAL FEATURES SOUTCE	gene	gene	
GlyGlyLysllealaTyr		GlyAsnTyrTrpThrSerAsnValSerTyrAsnArgSerThrThrGlnAsnLeuGluLys 375	. ø	GTGCAAAAATTACTTTTGATTTAAGCAAACGAATTTGGCTATCAGAATCTTTTTATA 1275 ArgThrSeralaArgAlaGlyTyrPhePheThrProGluAsnLysLysLeuGlyThr 479 :::	GlyLeuMetPheArgSerGlyGlyAlaSerSerValArgGlyTyrGluLeuAspSerIle 519	1567 GCTGCCGATAÀTTACACAGCAAAGAGCTGCCTTATGCCACAGGCGTTGCTGTGCTTGG 1626 580 PheSerProLeualaProPheSerPheaspilealaTyrGlyHisSerAsp 596 111111111111111111111111111111111111
314 GlyGlyLyslleAlaTy 	320aspT :: 955 AAAAATCCATTAAATT 336 AspMetAspLysTyrG :: 1015 GATACCAATACGAGAG	356 GlyAsnTyrTrpThrSerAsn 1048 TTACGTTATTGG 376 ArgAlaPheSerGlyGlyIle 1075 TGGCAATATTTGGCGGACT 396 GlyAlaGluPheLeuAlaGlu	1120 CAAGGGGATATC 416 SerHisalaThrMetLeu 1132 ACTGATAAAACCTTACTT 436 ProGluAsnGlyHisTyr 1156 CCAACTGTTGGATTACT	453	500 GlyLeuMetPheArgs 1187 ACACTGCTTTTTTTTTTTTTTTTTTTTTTTTTTTTTTTT	1567 GCTGCCGATAATTACA 580 PheSerProLeualaF 1627 GCATCGCCAGTGGGTG 597LYSLYSILARGT 1687 AGCAAAATATTCAAT

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AÇVYIKGSSYMLVYTYGNGVNGFTVDSSLGTPFLSHBINKIFBRKKIFSI NGGYYIRF
PTGVKKYIKFQENVPEGRPYTSKYIGSLADFHRNLLKGGIYLYFSTQSHPNĞKLR
LLYECNBARFLIEDAGGLASDGARRINDIKPTELHQRYPFFVGSKNMYHKVEFPELFL
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PID:1790680; identified by sequence similarity; putative"
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Conservative:
Mismatches:
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Best Local Similarity:
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S G	156 13889	ArgasnalaLeuGluasnTrpGlnGlnProValGlySerAspPheAspGlnAspSerTrp 175	
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g ç	409	SerAspIleAspLeuGlyAsnSerHisAlaThrMetLeuThrAlaSerTrpLysArgGln 428 :::	
<u>ک</u> خ	429	429 LeuLeuAsnAsnValLeuHisProGluAsnGlyHisTyrLeuAspGly 444	

AL646064 201050 bp DNA linear BCT 07-DEC-2001 Ralstonia solanacearum GMI1000 chromosome, complete sequence; segment 8/19. AL646064 AL646052 AL646064.1 GI:17428340 Submitted (167-DEC-2001) Genoscope and CNRS UMR-8030, 2 rue Gaston Cremieux, CP5706, 91057 Evry Cedex, France, Laboratoire de Biologie Moleculaire des Interactions Plantes-Microorganismes INRA-CNRS, BP27, 31326 Castanet-Tolosan Cedex, France, Fondation Jean Dausset-CEPH, 27 rue Juliette Dodu, 75010 Paris, France, LMGM CNRS 118 Route de Narbonne, F 31062 Toulouse Cedex 4, Genoscope and INRA Laboratoire de Biometrie et Intelligence Artificielle INRA, BP27, Raistonia.

[(bases 1 to 201050)
Salanoubat,M., Genin,S., Artiguenave,F., Gouzy,J., Mangenot,S., Arlat,M., Bllault,A., Brottier,P., Camus,J.C., Cattolico,L., Chandler,M., Choisne,N., Claudel-Renard,C., Cunnac,S., Demange,N., Gaspin,C., Lavie,M., Moisan,A., Robert,C., Saurin,W., Schiex,T., Siguier,P., Thebault,P., Whalen,M., Wincker,P., Levy,M., Weissenbach,J. and Boucher,C.A. 12983 TTACAAACCGGATCTTCTTGGTTACGAACTTATGCGCGCAATCACCGCGCCC----- 12933 12812 CCGCAAGATGCCAGTGGCGCTTTGACAGGGGCGAAATACATCGCCACCAGCTCAATCGAA 12753 13103 ATGACTTATACCCGTACGCGGACTCGCTCCAACAGTGGCTTACTGACTTGGGGCGGATAAA 13044 13043 CAGACGATTACCTTGGAATATGGCGATCCAGCATTGCTTTCAGAAACACGGGTATTGCF 12984 540 560 aAlaAlaAsnPheLysArgMetLysLeuLysHisGlySerGlyLeuGlyValArgTrpPh 580 462 ThrSerAlaArgAlaGlyTyrPhePheThr---ProGluAsnLysLysLeuGlyThrPhe 480 580 eSerProLeuAlaProPheSerPheAspIleAlaTyrGly------HisSerAspLy 597 Genome sequence of the plant pathogen Ralstonia solanacearum Unpublished Ralstonia solanacearum. Ralstonia solanacearum Bacteria; Proteobacteria; beta subdivision; Ralstonia group; 481 IleIleArgGlyGlnAlaGlyTyrThrValAlaArgAspAsnAlaAspValProSerGly -----PheLeuSerThrAlaLeuIleArg 501 LeuMetPheArgSerGlyGlyAlaSerSerValArgGlyTyrGluLeuAspSerIleGly 521 LeuAlaGlyProAsnGlySerValLeuProGluArgAlaLeuLeuValGlySerLeuGlu Db 12579 TGAGTTCAAAATCCACTTCACTTTAGGG 12552 597 sLysIleArgTrpHisIleSerLeuGly 606 2 (bases 1 to 201050) Boucher, C.A. Direct Submission Lys11eGlyThrThrLeuGlyThr DEFINITION ORGANISM TITLE JOURNAL REFERENCE AUTHORS TITLE JOURNAL 445 453 RESULT 22 AL646064 ACCESSION REFERENCE VERSION KEYWORDS SOURCE AUTHORS qq 8 g g q qq a ö qq g δ ò ò ò ò δ ŏ õ οy

source

FEATURES

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KRLIMWOLATKTEKPLAFGEVRRPGGAAGGPAAFFIGLPGNPVSSFVTFLLFVRPFIL
RLLGVDDVTPKRIPMRADFALPKGDRRNBFLRARINAGGGLDLFPNGSSGVLTSTVWG
DGLIDNDPNOPIAAGDVAFLPFAGLV"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          4361. 4957
//gene="RSC1329"
//function="miscellaneous; hypothetical/global homology"
//note="Product confidence : hypothetical
Gene name confidence : hypothetical
predicted by Codon_usage
predicted by Homology
predicted by FrameD"
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/gene="moaD" /function="small molecule metabolism; blosynthesis of
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                                                                                                                                                                                                                                  /evidence=not_experimental
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    Gene name confidence : probable predicted by Codon_usage predicted by Homology predicted by FrameD"
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/transl_table=11
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/gene="moeA2"
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IANVEGAMNAVVVQGDAVGPTLYYGKGAGAEPTASAVVADLVDVTRLHTADPEHRVPH
LAFQPDALSNTPLLPIEEVRSAYYLRMRVADETGVLADITRILAESGISIDAMLQKES
F31326 Castanet-Tolosan Cedex. Laboratoire de Genetique Cellulaire INRA, BPS7, F31326 Castanet-Tolosan Cedex Christian. Boucher@toulouse.inra.fr http://sequence.toulouse.inra.fr http://sequence.toulouse.inra.fr
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/function="small molecule metabolism; amino acid blosynnesis; threenine; product confidence: probable Gene name confidence: hypothetical predicted by Codon_usage predicted by Momology predicted by FrameD
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blosynthesis; threonine"
/note="Product confidence : probable
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                                                                                                                                                                                                                                  1. ,201050
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206. .1447
                                                                                                                                                                                            Location/Qualifiers
                                                                                                                                                                                                                                                                                                                            /strain-"GMI1000"
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   uSerAspGlyAsnLeuAlaGluTyrTyrArgAsnAlaLeuGluAsnTrpGlnGlnProVa 166
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                                                                                                                                                                                                                                                                                                                                                                              of
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    74 LeuIleThrGlnGlnGlnGluGluValLeuAspLysGluGlnThrGlyPheLeuAlaGlu
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cofactors, carriers; molybdopterin"
/note="Product confidence : probable
Gene name confidence : probable
predicted by Godon_usage
predicted by Homology
predicted by FrameD"
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Matches:
Conservative:
Mismatches:
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6586. .7116
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Query Match:
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101783 CGTGAACGTGGTTGGCAACAGCAAGACGCGCGAAGAGTGGTGCGCCGCGAGATGCGCCA 101842
                                                                                                                                                                                                                                                     Db 101963 GGTGGATGTCAACGTCAACGTGACCGACGACCGACCGCCAGATCAGCCTGGGCGTGGG 102022
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          e-----ThrArgThrLeuSerGlyAlaValPheHisAspMetGlyAspAl 560
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                378 eSerGlyGlyIleTrpTyrValArgAspArgAlaGlyIleAspAlaArgLeuGlyAla-- 397
                                                                                                                                                                                                                                                                                                                                   Db 102023 CTTCTCGTCGACCAAAGCTGGTGTCGCCGGGTATCCGCCAGGACAAACGTGTTCGG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                102141 ----Greaccagaracgacccgractrcacg------Greargcarcagccgcrcaac
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     ------ArgAsnTyrArgGlyAsnTyrTrpThrSerAsnValSerTyrAsnAr
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  102191 CGAGCTGTACTACCGCACGTACTACTACACCGGCGACCAGGACTAC---CG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Db 102248 CATCGTGCAGCGCGAGACATCAAGTTCGGCGTGCCGTTCTCGGAAACCGATACCGT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   uGlyAsnSerHisAlaThrMetLeuThrAlaSerTrpLysArgGlnLeuLeuAsnAsnVa
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        433 LLeuHisProGluAsnGlyHisTyrLeuAspGlyLysIle.......GlyTh
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                                                                                                                         nAsnGlyHisTyrSerGlyAlaSerValGlnAlaAspPheAspArgLeuGlnGlyAspAr
                                                                                                                                                                                                                                                                                               ------ValLysArgHisLysLeuGluThrGlyIleArgLeuAspSerGluTyrGl
                                                                                                                                                                                                                                                                                                                                                                                      312 yLeuGlyGlyLysIleAlaTyrAspTyrTyrAsnLeuPheAsnLysGlyTyrIleGlySe
                                                                                                                                                                                                                                                                                                                                                                                                                                                                     332 rValValTrpAspMetAspLysTyrGluThrThrLeuAlaAlaGlyIleSerGlnPro--
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    ------GluPheLeuAlaGluGlyArgLysIleProGlySerAspIleAspLe
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                                          eGlnProGlyThrProTyrAspLeuAspLeuLeuLeuAspPheGlnGlnAlaLeuGluGl
                                                                               Db 101843 GATGGAGTCGTCGTGGTTCGACGGCGAGAAGCTGCAGCTCTCGCAGAACCGCATCAACCG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Db 102362 GTTGGTCTACCAGAACTACGTGGCCAAGAACGGCCGCATT----
                                                                                                                                                                                                                gValProValLysValSerValThrGlu-----
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Gene name confidence : hypothetical
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predicted by Homology
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/note**Product confidence : probable
Gene name confidence : probable
predicted by Codon_usage
predicted by Homology
predicted by FrameD*
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REPEAT SM-5
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AL591792 AL591688
AL591792.1 GI:15075850
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Plantes-Microcrganismes, UNR215-ONR5-INRA, BP27, F-31326 Castanet,
France, Laboratoric de Genetique et Developement UNR6061-CNRS,
Faculte de Medecine, 2 avenue du Pr. Leon Bernard, F-35043 Rennes,
Universitate Bleiefeld, Blologie IV (Genetik) Universitatetst 25,
Universitate Catholique de Louvain, Place Croix du Sud 2, Bte 20,
B-1348 Louvain-la-Neuve, Belgium, Unite de Microbiologie, Faculte
des Sciences Agronomiques de Gembloux, Avenue Marechal Juin 6,
B-5030 Gembloux, Belgium, E-mail:Jerome.Gouzyétoulouse.inra-fr
http://sequence.toulouse.inra-fr/mellloti-html.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Direct Submission
Submitted (26-JUL-2001) Gouzy J., Submitted on behalf of the MELILO
EU Consortium
MELILO EU Consortium:
                                                   Db 102839 GTTCGCCGAAGGCCAGCCGTTCAAGGTCGCCGACATGCGCCTACTCCGCCGCGTTTTGGCCT 102898
                                                                                                                                                                      Db 102899 GTGGTGGCTGTGGCGGATCGGTCTCTGAAGATCAGCATGGGCTTCCCGATCAAGAGGAA 102958
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                                                                                                                       577 lArgTrpPheSerProLeuAlaPro------PheSerPheAspIleAlaTyrGl
                                                                                                                                                                                                                                                      Db 102959 GGCCGAAGACCAGACGCAACGCTTCCAGTTCCAGATCGGGACTGCATTC 103007
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complement(233, .1114)
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SOURCE
ORGANISM
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SME591792
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AUTHORS
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REFERENCE
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predicted by Codon_usage
predicted by FrameD"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Complement(5586. .6029)
/gene="azu2 OR SMc04047"
/function="small molecule metabolism; energy transfer;
/function="small molecule metabolism; energy transfer;
/note="product confidence : probable
Gene name confidence : putative
predicted by Godon_usage
predicted by Homology
predicted by FrameD"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     /product-"PROBABLE PSEUDOAZURIN (BLUE COPPER PROTEIN)"
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/db_xref="G1:15075855"
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    function="small molecule metabolism; energy transfer;
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/transl_table=11
/product="PUTATIVE CYTOCHROME C PROTEIN"
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Gene name confidence : hypothetical
predicted by Codon_usage
predicted by FrameD*
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/transl_table-11
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Evidence-not_experimental
5041. .5542
/note="Sm-2 OR SMC04873
REPEAT SM-2
                                                                                                               /evidence=not_experimental
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                                                                                                                                /transl_table=11
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333800

Length: Matches:

3.33e-11 342.00

Alignment Scores: Pred. No.:

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200631 TCGACCTTGATCATCAAGGCGGGCGAGCAGATCGTGAACGATCTCAAGGAACAGCAGCAGG 200690
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Db 200382 GACCGCGATCGCTCTCTACGAAAAGGCGCGTTACGGCGGCACGGTCAGC 200441
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           200217 GAAGAAGAAGTGCAGGTCATAGAC-------CCGGTTCGCTATACGCTGACT 200261
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   200321
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Db 200322 GTTCAGGATCAGGAAGAACCGGTCTCGGGCGATCTTGGCCTGGCGATCAAGGCGCGCGAC 200381
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Db 200442 ATCCTGGTCAACGGCCAGGACATTGACAGCCTACCCCGGGCCCGGCTTTCCCCGACGGC 200501
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        ValSerValThrGluValLysArgHisLysLeuGluThrGlyIleArgLeuAspSerGlu 310
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 158 AlaLeuGluAsnTrpGlnGlnProValGlySerAspPheAspGlnAspSerTrpGluAsn 177
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             SerLys------ThrSerValLeuGlyAlaValThrArgLysGlyTyr 191
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             200262 TTCGAGCCGGGAACGGATGACGAGGAGCTCCGGGAGGCGCTGGAAAACGCTCGCAGCTC
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         200541 ---GCATTCACGCTCGGCCACGTCAGGCTCGAGGGAGACGCGGCGCTC-----
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                                                                                                                                                                                                                             1 MetMetIleLysProThrAlaLeuLeuLeuProAlaLeuPhePheProHisAlaTyr
                                                                                                                                                                                                                                                                                          200124 CTCACAATCGTGGCCTCGGCCGTGCTCGGCCCGGTTTCCGTCGAGCAGGCCCACGCGTTC
                                                                                                                                                                                                                                                                                                                                                                                                                   -----AAGATCTTCGGAATGCGCTTCTTCGAAAGCGCG
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    75 IleThrGlnGlnGlnGluGluValLeuAspLysGluGlnThrGlyPheLeuAlaGluGlu
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             123 ------ThrValHisIleThrProGlyProArgThrLysIleAlaAsnVal
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            -------GATCCGCCGCCTACGACCTTAAGCGCGCGCCCCGCCGAC
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      102
267
158
24
                                       Mismatches:
Indels:
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      36.94%
21.81%
10.78%
Percent Similarity:
Best Local Similarity:
Query Match:
DB:
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                                                                                                                                                                                                          CTTCGGATCGAAGGCTCGGTCGATCGCCTCGGCAACCAATGTCGCCGGCCTCGAT 201167
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200988 ATCCAGGTAFCGGAAGGCAAGCACTATTTCGGTTTCGGCGGACAGGTCTCGACCACG 201047
                                                                                                      201048 GACGGCCTTGGCCTCCAGGGCTATTGGGGCCATCGCAATCTTTGGGACGTGCCGAATCG 201107
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                                                           TyrGlyLeuGlyGlyLysIleAlaTyrAspTyrTyrAsnLeuPheAsnLysGlyTyrIle
                                                                                                                                                                           331 GlySerValValTrpAspMetAspLysTyr---GluThrThrLeuAlaAlaGlyIleSer
                                                                                                                                                                                                                                                                                                 350 GlnProArgAsnTyrArgGlyAsnTyrTrpThrSerAsnValSerTyrAsnArgSerThr
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Submitted (24-OCT-2000) Department of Veterinary Pathobiology,
University of Minnesota, 1971 Commonwealth Ave., St. Paul, MN
55108, USA
Pasteurella multocida PM70 section 185 of 204 of the complete
                                                                                                                                                                                                       gamma subdivision; Pasteurellaceae;
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                                                                                                                                                                                                                                                                                                                                  Complete genomic sequence of Pasteurella multocida, Pm70 Proc. Natl. Acad. Sci. U.S.A. 98 (6), 3460-3465 (2001) 21145866 11248100
                                                                                                                                                                                                                                                                                        Whittam, T.S.
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May, B.J., Zhang, Q., L1, L.L., Paustlan, M.L.,
Kapur, V.
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Pasteurella.
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                              genome.
AE006218 AE004439
AE006218.1 GI:12722230
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Zhang,Q. and Kapur,V.
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HFASEGFLQFFFEDNSDGSFNVYILDEANRIEIXRNCGGKEKKILEINHIYQSSGLD
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1083 TTAATGCAACCTGTTTTAGATGAA---GAACACAAAATTGTGAATGTCGATGTATTGCTC 1027
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                                                                                                                                                                                                                                                                                                    ValTrpAspMetAspLysTyrGluThrThrLeuAlaAlaGly-------1le 348
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                                                                                                                     DNA linear BCT 18-DEC-2001 circular chromosome, section 233
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Agrobacterium tumefaciens str. C58 (Cereon)
Bacteria; Proteobacteria; alpha subdivision; Rhizobiaceae group;
Rhizobiaceae; Rhizobium.
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Hinkle,G., Slater,S.C. and Goodner,B.
Complete Genome Sequence of Agrobacterium tumefaciens C58
(Rhizobium radiobacter C58), the Causative Agent of Crown Disease in Plants
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2 (bases 1 to 10029)

Hinkle,G., Slater,S.C. and Goodner,B.

Direct Submission

Submitted (14-AUG-2001) Cereon Genomics, 45 Sidney Cambridge, MA 02139, USA
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119, .2044
                                                                                                                                            Agrobacterium tumefaciens str. Cof 234 of the complete sequence. AE008175 AE007869
AE008175.1 GI:15157816
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              /gene-"AGR_C_4742"
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                       82
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AE008175
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DEFINITION
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AUTHORS
TITLE
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AUTHORS
                       105
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JOURNAL
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KEYWORDS
SOURCE
                                                                       RESULT 25
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                                                                                                 AE008175
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Matches: Conservative: Mismatches:

323.50 36.95% 22.60% 10.20%

> Percent Similarity: Best Local Similarity:

Query Match: DB:

Indels:

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COMPLEMENT (9035. .9880)
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       /translation-*MMMCVFRHGGMIVVSVEASYRRVARTALREGTPATGERAVPEEV
PVAFSYGGSTHAVMASPADLIDFAVGFSLTEGIISMRSETGAIEVVEAGGCYDVQVD
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                                                                                                                           AINGKISADSVNAGTAAISGLNATIGHSGTTTAFDVNRRYDDNPLVVKGSADTGGSPM
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RELEILTRENDETTGNITGGGGLVPVLDMKADSTOSTVVSVSGNADDFFRASSA
PALEODEVMAQLIFGGSMSKLSALOIARLADAAQLAGGRSTSLFDKLRSNLGYDDLD
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7187. .9004
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10029

Length:

5.89e-12

Alignment Scores: Pred. No.:

ORIGIN

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GCCCGCGACGCCACCATCCGCTCACCATCGAAGTGTCCGAAGGCAAGCACGTTATTT 1075
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               835
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        775
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                                                     173 ACCGCGCTTGCGGTTGCTTTGACGTTCGCCCTGTATCCGGCGTTT-----GCCCGTGAT 226
                                                                                                              286
                                                                                                                                                                                                                                                                                      389 GACAAACCTGCCTCCGGCGATCTCGGCCTTCTGATAAAGGCGGCGAGACGACAGGGACAGG 448
                                                                                                                                                                                                                                                                                                                                                                            -----GluLysAspGlyAla 121
                                                                                                                                                                                                                                                                                                                                                                                                                                   TyrThrValHisIleThrProGlyProArgThrLysIleAlaAsnValGlyValAlaIle 141
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            LeuGlyAspIleLeuSerAspGlyAsnLeuAlaGluTyrTyrArgAsnAlaLeuGluAsn 161
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   AlaValAsnProAspThrAlaThrValAspLeuAsnValValValAspSerGlyArgPro 221
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            GlnAlaLeuGluGlnAsnGlyHisTyrSerGlyAlaSerValGlnAlaAspPheAspArg 281
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             302 GluThrGlyIleArgLeuAspSerGluTyrGlyLeuGlyGlyLysIleAlaTyrAspTyr 321
                                                                                   45
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                                                                                                                                                                                                  IleLysAspMetValGluGluHisLeuProLeuIleThrGlnGlnGlnGluGluValLeu 83
                                                                                                  ATGGTCATAACGGTAACGCCGGGCCCGAAATTCACCCTCGGCAAC-----GTTCGCCTT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           182 ValLeuGlyAlaValThrArgLysGlyTyrProLeuAlaLysLeuGlyAsnThrArgAla
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          CTGATCGATGATCTGAAGGCCGGAAGCCGGCCGCTCGCGAAACTGACGAAACGCGGCG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              776 GTCGCAAACCACGCGACGAATACGGTCGACATTACAATGGCAGCTGAAGGTGGCCCCGTC
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            222 IleAlaPheGlyAspPheGluIleThrGlyThrGlnArgTyrProGluGlnIleValSer
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   GlyLeuAlaArgPheGlnProGlyThrProTyrAspLeuAspLeuLeuAspPheGln
                          6 ThralaLeuLeuLeuProAlaLeuPhePheProHisAlaTyrAlaProAlaAlaAsp
                                                                                  26 LeuSerGluAsnLysAlaAlaGlyPheAlaLeuPheLysAsnLysSerProAspThrGlu
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                                                                                                                                                                      287 GTTATCAAC---CCGGTCAAATATGCCGTCACGCTTGACGCGGCCGACGCCGACAAGTCC
                                                                                                                                                                                                                                                           AspLysGluGlnThrGlyPheLeu------AlaGluGluAlaProAspAsn
                                                                                                                                                                                                                                                                                                                   ValLysThrMetLeuArgSerLysGlyTyrPheSerSerLysValSerLeuThr-----
                                                                                                                                                                                                                                                                                                                                                                                                       509 GGAAAGAACGTTGATGACCTGCCTCCCAACCCGGTTTTCGATCACAGCACGCCTGTACCC
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             --------GCCGCTGATGCCGGGTCTCTGGCAATTATCCGCGCCGGCAACAAG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    LeuGlnGlyAspArgValProValLysValSerValThrGluValLysArgHisLysLeu
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φy	322 Tyr	TyrAsnLeuPheAsnLysGlyTyrIleGlySerVal 333	
gg	1136 CGT		ស
0y	334	ValTrpAspMetAsp338	
Dp]	1196 GAG	GAGGCATCGAGCGTCGAAGGCATGGATTATTCGCCGGCATTACCTTCACCAAGCCGGGG 125	S
ογ	339		
C qq	1256 ATG	ATGTTCAACCCCCCCACGACGTTCAAGACCAGCCTGATTGCCAAGACCGAAAACCCGGAC 131	2
		AsnTyrArgGlyAsnTyrTrpThrSerAsnValSerTyrAsnArgSerThrThrGlnAsn 372	
8	1316 ACC	GGCCAAAACGCTGA	S
δ	373 Leu	LeuGluLysArgAlaPheSerGlyGlylleTrpTyrValArgAspArgAlaGlylleAsp 392	
Dp.	1346	GCGGGTTTCGCCTACGAACTGAACGAT137	2
ογ		rgLeuGlyAlaGluPheLeuAlaGluGlyArgLysIleProGlySerAsp1leAsp :::: ::: ::: ::: ::: ::: ::: ::: :::	
<u> </u>	m		0
δ		LeuGlyAsnSerHisAlaThrMetLeuThrAlaSerTrpLysArgGlnLeuLeuAsnAsn 432	
<u>е</u>	1421 GAT	CATTCGGCAAAAACGAATATCTGACGACCTCGATACCGCTGGAATTTGTGCGCGAC 148	0
οy	433 Val	ValLeuHisProGluAsnGlyHisTyrLeuAspGlyLysIleGlyThrThrLeuGlyThr 452	
Dp 1	1481 ACG		9
ογ		PheLeuSerSerThralaLeuIleArgThrSerAlaArgAlaGlyTyrPhePheThrPro 472	
g T	1517 CGC	CATCCTTGGCCGCCAAGCCAAGCTATGAAGCGCTCAATGGCACGTTCTTCTCTCTT 1570	9
Qy	473 Glu	GluAsnPhellelearg 483	
ි අූ	1577 TTC	rgccgaagaccggttgatca	9
ó	484 Gly	GlyGlnAlaGlyTyrThrValAlaArgAspAsnAlaAspValProSerGly 500	
	1637 GGA	GGAAAGCTCTCCGGCGGTGTTCTGGTGGCCGCCAGCGATCTACAGGATATACCGACCACC 1696	9
δλ	501 Leu	LeuMetPheArgSerGlyGlyAlaSerSerValArgGlyTyrGluLeuAspSerIleGly 520	
g G	1697 CGC	GCTTTTTCGCCGGTGGCGGGTCGCTGCGCGCTATAGCTACCAGGAGATTTCG 1750	9
0у	521 Leu	LeuAlaGlyProAsnGlySerValLeuProGluArgAlaLeuLeuValGlySerLeuGlu 540	
е В	1757 CCC	CCCTATAATGCGGCGGGCGATGCCACTGGCGGCCGCTCCTACGTGGTTGGCTCCGTTGAG 181	9
	541	വ	
g G	1817 GCC	GCCCGCATCAAGGTCACCGATACCATCGGCCTTGTTGCGACGCCGGGCGTCGT 187	9
ογ	559	ArgMe	
Dp 1	.877 TCT	TCTGATGGGGTAACACCCGATTTCTCCGATATCCGGGCCGGTGCCGGTATCGGC 193	0
ογ	577 Val	ValArgTrpPheSerProLeuAlaProPheSerPheAspIleAla 591	
g C	1931 CTG	crecerracecacecerrececererecerrecarerece 1975	
RESULT 26 AE009208 LOCUS DEFINITION	_	AE009208 10301 bp DNA linear BCT 20-DEC-2001 gyrobacterium tumefaciens strain C58 circular chromosome, section	-2001 ion
ACCESSION		4 Ol 230 Ol the complete sequence. 009208 AE008688	

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Agrobacterium tumefaciens str. C58 (U. Washington).

Agrobacterium tumefaciens str. C58 (U. Washington)

Bacteria: Proteobacteria: alpha subdivision; Rhizobiaceae group;
Rhizobiaceae: Rhizobium.

1 (bases 1 to 10301)

Wood, D.W.; Setubal.<sup>3</sup>.C.; Kaul.R.; Monks, D.; Chen, L.; Wood, G.E.;
Chen, Y.; Woo, L.; Kitajima, J.P.; Okura, V.K.; Almeida Jr., N.F.;
Zhou, Y.; Bovee Sr., D.; Chapman, P.; Clendenning, J.; Deatherage, G.;
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Karp, P.; Romero, P.; Zhang, S.; Yoo, H.; Tao, Y.; Biddle, P.; Jung, M.;
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Zhao, Z.; Dolan, M.; Tingey, S.V.; Tomb, J.; Gordon, M.P.; Olson, M.V.
The genome of the natural genetic engineer Agrobacterium
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SYALTYPERGRILSYBERLDFRARLDFRADDFRFPALLARAMALBRGSDGAALNAA
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Wood, D.W., Setubal, J.C., Kaul, R., Monks, D., Chen, L., Wood, G.E., Chen, Y., Woo, L., Kitajima, J.P., Okura, V.K., Almeida Jr., N.F., Zhou, Y., Bovee Sr., D., Chapman, P., Clendenning, J., Deatherrage, G., Gillet, W., Grant, C., Guenthner, D., Kutyavin, T., Levy, R., Li, M., Saenphimmachak, C., Wu.Z., Gordon, D., Elsen, J.A., Paulsen, I., Karp, P., Romero, P., Zhang, S., Yoo, H., Tao, Y., Biddle, P., Jung, M., Zhao, Z., Dolan, W., Perry, M., Gordon-Kamm, B., Liao, L., Kim, S., Hendrick, C., and Nester, E.W.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Direct Submission
Submitted (27-SEP-2001) Department of Microbiology, University of
Washington, 1959 NE Pacific Ave, Box 357242, Seattle, WA
98195-7242, USA
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Science 294 (5550), 2317-2323 (2001)
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148
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Conservative:
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              KADIRSLPASLANAFAAGLDAAGSISGTVSAKGAASDPSVDYNLNWANAEVAQTRAAG
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                                                                                                                        HNDLEDLEAKLKAADPNAPKLIAFESVYSMDGDIAPIREICDLADRYGAMTYLDEVHA
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339		52
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	1490449104491041199090	00 0
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Simpson, A.J. G., Reinach, F.C., Arruda, P., Abreu, F.A., Acencio, M., Alvarea, L.M. C., Arraya, J.E., Bala, G.S., Baptista, C.S., Bartonga, R., Alvaes, L.M. C., Arraya, J.E., Bala, G.S., Baptista, C.S., Bartonga, R., Alvaes, L.M. C., Bordin, S., Bove, J.M., Briones, M.R.S., Barcos, M.H., Colauto, M.B., Colombo, C., Costa, F., Costa, M.C.R., Cortano, D.M., Coutinho, L.L., Cristofani, M., Dias-Neto, E., Docena, C. M., Ferreira, A.G., Ferreira, A.G., Ferreira, M. Goldman, M.H.S., Gomes, S.L., Gruber, A., Ho, P.L., Hohelsel, J.D., Junqueira, M.L., Kemper, E.L., Kitajima, J.P., Krieger, J.E., Kuramae, E.E., Lajgret, F., Lambals, M.R., Lette, L.C.C., Lemos, E.G., Lemos, R.C., Mardina, J.P., Mardielra, A.M.B.N., Madeira, H.M. F., Marino, C.L., Marques, W.V., Martins, E.A.C., Mardino, J.A., Marcae, E.C., Martins, E.A.C., Martino, C.L., Marques, W.V., Martins, E.A.C., Martino, C.L., Marques, W.V., Martins, E.A.C., Marcho, A.L., Colliveira, M.A., Medelra, M.N., Maccae, E.C., Marcho, A.L., Colliveira, M.A., Medolive, M., Nobrega, F.G., Nunes, L.R., Oliveira, M.A., de Oliveira, M.C., de Oliveira, R.C., Palmieri, D.A., Peris, A., Pelxoto, B.R., Roberto, P.G., Rodriques, V., Sawasaki, H.E., de Silveira, M.S., Gawasaki, H.E., de Silveira, M.S., C.R., Santelli, R.V., Sawasaki, H.E., de Souza, A.P., Terenzi, M.F., Truffi, D., Tsai, S.N., Souza, A.A., de Souza, A.P., Terenzi, M.F., Truffi, D., Tsai, S.N.,
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The genome sequence of the plant pathogen Xylella fastidiosa. The Colonal fastidiosa Consortium of the Organization for Nucleotide
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Xylella fastidiosa 9a5c
Bacteria; Proteobacteria; gamma subdivision; Xanthomonas group;
540
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                                                                                                                                                                                                                                                                                                                                                           ...--AspAlaAlaAlaAsnPheLysArgMetLysLeuLysHisGlySerGlyLeuGly
                                                                                          521 LeuAlaGlyProAsnGlySerValLeuProGluArgAlaLeuLeuValGlySerLeuGlu
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   577 ValArgTrpPheSerProLeuAlaProPheSerPheAspIleAla 591
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Nature 406 (6792), 151-157 (2000)
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AE003957
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SAFNRYPDWHTGVGIGLRYRSPVGFVRVDIARGLNSPDSKIQLYIDIGANL*
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Tsuhako, M.H., Vallada, H., Van Sluys, M.A., Verjovski-Almeida, S., Vettore, A.L., Zago, M.A., Zatz, M., Meidanis, J. and Setubal, J.C. Direct Submission
Submitted (02-JUN-2000) Organization for Nucleotide Sequencing a Analysis, Bloinformatics Lab - IC/Unicamp, C.P. 6176, Campinas, 13083-970, Brazil
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complement(271. .759)
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/note="found by tRNAscan"
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LGDAGGGGGLCHADWPHEGLVLKGOLLETLVHPWICHKKRGRSI NLKGGALTLDGHLRP
LGDAWEGSFRASSLEGG IR LGEPTRADDLYWNDSRLYWLDEFSVYDDLTSGHIVGKL
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Submitted (13-NOV-2001) Integrated Genomics, Inc., 2201 W. Campbell Park Drive, IL 60612, USA 5 (bases 1 to 10029)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Direct Submission
Submitted (13-NOV-2001) Unite de Recherche en Biologie Moleculaire,
Laboratoire d'Immunologie et de Microbiologie, Universite of Namur,
61 rue de Bruxelles, Namur 5000, Belgium
6 (bases 1 to 10029)
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Submitted (13-NOV-2001) Faculte de Medecine, INSERM U431, Avenue
Kennedy, Nimes 30900, France
Location/Qualifiers
                                                                                                                                                                                                                                                                                                                                                                                                                            Submitted (13.NOV-2001) Department of Veterinary Science, LSU Ag
Center, 111 Dalrymple Building, Baton Rouge, LA 70803, USA
4 (bases 1 to 10029)
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The genome sequence of the facultative intracellular pathogen
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Elzer, P.H. and Hagius, S.
Direct Submission
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DelVecchio,V.G., Redkar,R.J., Patra,G. and Mujer,C.
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YGDKALFHDIVNRCWDGKSVCLDDEMHRQOMIREARASLRKSSPIDFSQWANDIICTV
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/transl_table=11
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/db_xref="G1:17983946"
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Matches:
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/protein_id-"AAL53084.1"
/db_xref-"GI:17983947"
/prote1n_id-"AAL53082.1"
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/gene="BMEI1903"
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Lee, H.J. and Kang, H.S.
Sequence analysis of 42C11 fosmid clone of Zymomonas mobilis ZM4
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TATCGGCGTCAGCGCGGGAAACACGGAAACATCATCGGCGGGGCGCTCGTCGTCGTCGGCCAA 309
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                                                                                                                                                                                                                                                              481 -IleIleArgGly-----GlnAlaGlyTyrThrValAlaArgAspAsnAlaAspValPr 498
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                                GTTTGCCAAGCGGGATTTCACGACTGCGGGGCTTGAGGGCCAATTTGCTCTATGATAGCCG
                                                                                  rLeuGluTyrGlnLeuProPheThrArgThrLeuSerGlyAlaValPheHisAspMetGl
                                                             -AsnAsnValLeuHisProGluAsnGlyHisTyrLeuAspGlyLysIleGlyThr----
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/organism="Zymomonas mobilis"
/strain="ZM4"
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Lee, H.J. and Kang, H.S.
Direct Submission
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TEAGE 1 OF THE PROPERTY OF THE NKETVHDLSGVKRKGQVEDTAAHQTKESSASASMLASAWKLDTRISAPDQLEYNAGMGL ESEWEADLRVRGTATAPNITGDMRVIRGTYTFAGRRFDIDHGEIQFTGGNPPNPALDI TAAATVODITATVKIGGEPRINKPEITFSSSPSLAQDEILSKLLFGSSYTSLSAVQAVQL AAALWILRTGGKGFDEDRIKRSVIGIDRLRVVGANSSTGGGTSLAAGKYLFKNVYMEV ITDTHGFTATQIRISLTRTLSLLSEASSFGSSNVSLRYSKDY* AVNADIAIDKAHFVYGQPIDIESGRIRGKAVFSTDPĀFQVEALLNNIRYNDFLLKQAĀ GRABYQKEGGEGGLTLGGNLPARGASPPFRVNI HISSFSADVTRANAGONVAHLNWHM AAPVENSGRINGYDISKIVYQLPKGHIDI.SGHYGGONSYAALQIADIDI.SEAALLMPE INLSGQLSAVANADILGGNIPQISARLALINFTRVSVTGLSQPVNLVVAATNDKNGLVS ASSWWAANAATVISEPDSHDGRVHFITANLATMLHRHLEAQTTTAQLNQMFSNSCFFA HHPPLECGGPISDEGAANHMRITSAHGRTGINFFVGEKNDTYPAKQKIRASQAVARL GEVKPDLAWFTPQKKEALAKGAFHNDVVAVANEYVLLAHARAFEDGEWIKRIASGAVARL GFIPIIIDNITLEGAAVKSYLENSQIYTLKDRTWALILPQEVKSDPAVWETVNRIISGN PRIKAAVVDVRESMANGGERACLRIKYPLSKAALEAVDORFILTPKRWEKLYQLVEN FWPRIITPDDLVLPELWKTAVRAHWALTSWLG COMPLEMENT (1937, 3067) RLIMMRFSPETSIGSGLRGYVRMLFDASGYYPVADNVVLAGRFRVASIEGASVQELAPS RRIYAGGGGSVRGYGYQQLGPKDPYKDAVGGLSEEELAFEVRYRFGNFGLVPFIDAGQ VYEDAIPTFHNLRFGTGLGARYYTAFGPFRIDLATPIARQPGESRISVYISIGQAF" /product-"succinylarginine dihydrolase" /protein_id-"AAD21533.1" /db_xref-"G1:4511973" /translation-"MYSEVNPDGLIGPTHNYAGLSRGNVASALHAGQPSYPRQAALQ /protein_id="AaD21540.1" /db_xref="G1:4511980" /translation="MIPLFLQLMLMD1FDQSKFFLDKMTGKAGKGTLTAKGYASFDAA SDYDSALNITLDKATLARADEMKSTVSGNLDITSNRKDGGSIKGKLKLPETRYRFIMD /protein_id="AAD21536.1" /db_xref="G1:4511976" /translation="MTDQNYNPERQENSSDSIKEKNPNIVAQPENTEANPNKTSPPQN GLEKMKHLMDMGLTQGVFLPPLRPVTHLLHHLGYKGDDKTILKQAARMIGCYFNNLCS LWQKRWTYSIGAELTQTNERSYDFSRSERLTRFYLIAALPGQLGYDRSNNLMNPTKGY complement(6106. .8322)
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TPBELILLSTANSLGADYPACVDSCLYKGEGVGEKTOTGORSELEKPLLLVNPRVSCS
TPMIFKNWGVDRGALDSDGSILGAARSGRNDLEPPARKILPIIGEVVEWLQQQKGVS
FSRMSGSGATCFALFDEIEDRDTAYKKLNIDHPEWWALSSLLR
VVLKGADTVIATPDGRAAISQPAVSWLANAGTGDVLSGICGAMLARGMDPFDAACTAV
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                                                                                                 complement(13922, .14641)
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             complement(14821, .15606)
/note="hypothetical protein; orf6"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Conservative:
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         OAFVTPLRSLSKAVAKVGDGKQHIFTETGPKELRHVAQAFNOWMRIEHMLRERTEML.
AAVSHDLRTPLLARLQLRASTIEEDDIREAVEADLQENATMIKSVLQFLRGDQDPEVKR
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TETLVNATROLLGKRAIIERALHYGKKAI
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KREEGKLSLTNLQEGGLRAEIFLPAAONKIRKKOGGKGYYFSARKGLELLRRPK"
COMPLEMENT (9737. . 10462)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       /product-"aerobic respiration control protein"
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/db_xref="GI:4511977"
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               SRTVDLILMDYMLPGKNGLDLTRELBSNSOVMAIPVELSARDDETDRYVGLELGGDD
YIPREPGKKELVARYRAVLARSQAVKEADGAPOSHLIHFGGWLDPDRRELHSPTGAG
YEBGGAEFDLLLSFLQHAQRVIGRERLLELSRSRLSEASDRSIDVLVSRLRRKLSSQT
EAGDMIRTIRGUGYWTVPVSQD
COMPLEMENT (10491. .10865)
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IEMTLADQGIDCLLVMPFPETLEATEAITAFAAEKGFARLSIDQGYGVETRWESERVT
VTLGAVPVTLPAHAFLQATKDGEQTLVHMVKEAVGDAHFVADLFSGLGTFALSFEKDK
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SEPKTDAAKKARSLFSGKVTSLDEAEAAPLLIDALFGVGMSRSLDNALLSKLTALSKA
ASLRIAIDVPSGVDTDKGSLLSDIPAFDLTIAIGALKPAHRLEPSATICGRVAVGDID
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KEQIANLAILPNGRIVYVSCNPATFARDAKTLLEAGWVLHWVRPVGQFPWSLHVEMVG
LFTKM"
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LDADALFLLSREGLDCLRNIQOPTIITPHEGEFKRLFEGISGDKLTRVTRAAALSGLV
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complement(10920. .12113)
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                                   complement(8322, .9662)
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                                                                                                                                                                                                                                     /product-"chemotaxis
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6 G	146 Le 7554 AA	LeuSerAspGlyAsnLeuAlaGluTyrTytArgAsnAlaLeuGluAsnTrpGlnGlnPro 165 	
ر و و	166 Ve	ValGlySerAspPheAspGlnAspSerTrpGluAsnSerLysThrSerValLeuGlyAla 185 	
8 8		205	
<u> </u>	7434 CT 206 As	TGCCGCATTATGGTTATCCTTTTGCAAAAATTGGCGATCGGACAATACTGCTGGATGAT 7375 SPThrAlaThrValAspLeuAsnValValValAspSerGlvArqProlleAlaPheGlv 225	ın .
. a		GAAACCGATACAGTGACTATACAGTAACCGGAAATGCAGGAAATGTTGGATCTTACGGT 7315	2
r o	226 As	AspPheGlulleThrGlyThrGlnArgTyrProGluGlnIleValSerGlyLeu 243 :::::::	ıç
λo	244	263	,
Dp		KGCCTTTTAAAGAAGGTCAGCGCTATGATAGCCAGATGGTTGATGATCTCCGCCAAGCT 7195	5
<u>ک</u> ۾	264 Le 7194 CI	LeuGluGlnAsnGlyHisTyrSerGlyAlaSerValGln	. vo
Ωý	772	AlaAspPheAspArgLeuGlnGlyAspArgValProVal 289	
q	7134 CC	CGCGAAGATGGAAGCGAAATTGTGGATCTCCACGTTAGGCAGGGA7090	0
Qγ	0	LysValSerValThrGluValLysArgHisLysLeuGluThrGlyIleArgLeuAspSer 309	
g	7089	AGCATTGCTGTAAGGAAACACAGCATTGCTGTTACGGGT 7057	7
Qγ		GluTyrGlyLeu	
g	w	GTTATGGCACGGGTGAGGGCTTTAAGGCGCAAGGTAGCTGGATCAGCCGTAATTATTTC 6997	7
ογ	322	322	
g)O 9669	CCACCCGAGGGATCATTAACTTTTTCGGGGATTTTGGGTACCCGCCAGCAACAGCTTTCT 6937	71
ογ	323 As	alValTrpAs	
Ор	9E69	GCTCTCTTTAACCGAAATAATGCTGGGGCAAGAGACCGTGTTATTCAA 6889	6
ò	342 T	ThrThrLeuAlaalaGlyIleSerGlnProArgAsnTyrArgGlyAsnTyrTrpThrSer 361	
QQ	6888 A7	TTGGTTTGACCGCGGTCGGGAGAGATACGACGTTATAATGGTTATAGCTTTTCTCTC 6829	<u>و</u>
ογ	362 As	AsnValSerTyrAsnArgSerThrThrGlnAsnLeuGluLysArgAlaPheSerGlyGly 381	
QQ	6828 G	GAGGGAGCTTGTCGCGACAATCTACCCAGTTATGGCAAAAACGC 6784	4
ογ	382 I	IleTrpTyrValArgAspArgAlaGlyIleAspAlaAAgGeuGlyAlaGluPheLeuAla 401	
QQ	6783	TGGACTTATTCTATCGGAGCAGAATTAACACAG 6751	.
δ	402 G	GluGlyArgLys1leProGlySerAspIleAspLeuGlyAsnSerHisAlaThr 419	_
QQ	6750 A	ACCAACGAGCGGAGTTATGATTTCTCTCGATCGAGGGTTAACCCGT 6703	33
ογ		MetLeuThrAlaSerTrpLysArgGlnLeuLeuAsnAsnValLeu 434	
qq	6702 T	TTTTATCTGATCGCGCGCTCCCCGGGCAATTGGGATATGACCGTTCCAACATCTGATG 6643	E.
ò		HisProGluAsnGlyHisTyrLeuAspGlyLysIleGlyThrThrLeuGlyThr 452 :::	
요	6642 A	AATCCAACCAAAGGTTACCGCTTGAATATGCGTTTTAGTCCTGAAACTTCAATCGGTTCT 6583	33

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Xanthomonas oryzae pv. oryzae xanthomonadin biosynthetic gene
cluster, partial segence.
AY010120
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Goel,A.K., Rajagopal,L., Nagesh,N. and Sonti,R.V.
Genetic locus encoding functions involved in biosynthesis and outer
membrane localization of xanthomonadin in Xanthomonas oryzae pv.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Amino acid sequence update by submitter
4 (bases 1 to 20310)
Goel.A.K., Rajagopal,L., Nagesh,N. and Sonti,R.V.
Direct Submission
Submitted (15-MAR-2002) C.C.M.B., Habshiguda, Hyderabad, A.P. 500
007, India
Sequence update by submitter
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Submitted (18-OCT-2000) C.C.M.B., Uppal Road, Hyderabad, A.P. 500
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Direct Submission
Submitted (01-AUG-2001) C.C.M.B., Habshiguda, Hyderabad, A.P. 500
                                                                                                                                               6418
                                                                                                                                                                                                                                                                                                                                                      6204 GCTTTTGGTCCTTTCCGCATTGATCTTGCGACACCTATAGCTCGGCAGCCTGGAGAATCT 6145
:::
6357 CTGTCCGAAGAACAG-----CTTGCTTTCGAAGTGCGTTACCGTTTTGGTAATTTTGGT 6304
                                                                                                                                                                                                                                                                                                              Xanthomonas oryzae pv. oryzae
Bacteria; Proteobacteria; gamma subdivision; Xanthomonas group;
                                                                                                                    492 ArgAspAsnAlaAspValProSerGlyLeuMetPheArgSerGlyGlyAlaSerSerVal 511
                                                           473 GluAsnLysLysLeu---GlyThrPheIleIleIleArgGlyGlnAlaGlyTyrThrValAla 491
                                                                                                                                                                            512 ArgGlyTyrGluLeuAspSerIleGlyLeuAlaGlyProAsn------GlySer 527
                                                                                                                                                                                                                                                                                               543 ---LeuProPheThrArgThrLeuSerGlyAlaValPheHisAspMetGlyAspAlaAla 561
                                                                                                                                                                                                                                                                                                                                                                                                                582 ProLeuAlaProPheSerPheAsp------IleAlaTyrGlyHisSerAspLys 597
                                                                                                                                     528 ValLeuProGluArgAlaLeuLeuValGlySerLeuGluTyrGln-------
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Goel,A.K., Rajagopal,L., Nagesh,N. and Sonti,R.V.
Direct Submission
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Direct Submission
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Xanthomonas oryzae pv. oryzae.
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COMMENT

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                                                                                                                                                                                                                                                                                                                                                              WOULGSPRAAMVEDLURDPPWELLHAARTLOPAAMPOTRINDWETSHATEDDAY
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    유
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Location/Qualifiers
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/codon_start=1
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/product_*putative acyl carrier protein"
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*Profein_1.de-"aAG3842.2"

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                                                                                                                                                                                                                                                                                                                                                      AspThrGlnAspSerGluIleLysAspMetValGluGluHisLeuProLeuIleThrGln 77
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Matches:
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/note="Orf10"
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                                                  AAGCTGGATTACTTCAGCACCATCGATATCCAGCCCAAGCCCGAAGAAGCCGACGACCAG 1000
                                                                                                                                 GGCCTGAGCTACGGCAGCGAGAGGGGCGCCGGTGTGCGGTGGCGTGGAGCGGCGTTAC 1117
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1172 AAGAGCTGACCACCAGCTACCGCGTACCGGCGTTCCGTTGGCTGGATGGCTGGTACACC 1231
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                                                                                                                                                                                                               GlyIleArgLeuAspSerGluTyrGlyLeuGly-----GlyLysIleAlaTyrAspTyr 321
                                                                                                                                                                                                                                                                                                                          TyrAsnLeuPheAsnLysGlyTyrIleGlySerValValTrpAspMetAspLysTyrGlu 341
                                                                                                       GlyAspArgValProValLysValSerValThrGluValLysArgHisLysLeuGluThr 303
GlnAsnGlyHisTyrSerGlyAlaSerValGlnAlaAspPheAspArgLeu-----Gln 283
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          ThrSerAsnValSerTyrAsnArgSerThr------ThrGlnAsnLeuGluLys
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da Silva, A.C.R., Ferra, J.A., Reinach, F.C., Farah, C.S., Furlan, L.R., Quaggio, R.B., Monteiro-Vitorello, C.B., Van Sluys, M.A., Almeida Jr., N. Alves, L.M.C., do Amaral, A.M., Bertolini, M.C., Canargo, L.E.A., Camarotte, G., Cannavan, F., Cardozo, J., Canaroto, F., Cardozo, J., Cardozo, J., Caranavan, F., Cardozo, J., Caranavan, F., Cardozo, J., Ferroina, R.B., Coutinho, L.L., Cursino-Santos, J.R., El-Dorry, H., Faria, J.B., Ferreira, A.J.S., Ferreira, R.C.C., Ferroy, M.I.T., Fornighieri, E.F., Franco, M.C., Greggio, C.C., Gruber, A., Katsuyama, A.M., Kishi, L.T., Leite Jr., R.P., Lemos, E.G., Machado, M.A., Marlins, A.M. B., Marlins, E.C., Matdanis, J., Madeira, A.M. B., Myaki, C.Y., Moon, D.H., Morelia, L.M., Novo, M.T.M., Oliveira, W.C., Oliveira, V.R., Pereira Jr., H.A., Tamura, R.E., Teixeira, E.C., Tezza, R.I.D., Trindade dos Santos, M.Y. Tamura, R.E., Teixeira, E.C., Tezza, R.I.D., Trindade dos Kitajima, J.P.
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                                    Xanthomonas axonopodis pv. citri str. 306.
Xanthomonas axonopodis pv. citri str. 306
Bacteria; Proteobacteria; gamma subdivision; Xanthomonas group;
588 eAspIleAlaTyrGly.....HisSerAspLysLysIleArgTrpHisIleSerLeuGl 606
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Xanthomonas axonopodis pv. citri str. 306,
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Nature 417 (6887), 459-463 (2002)
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/gene="idnK"
/note="XAC4197; gntV"
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/codon_start=1
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                                                                 AspThrGlnAspSerGluIleLysAspMetValGluGluHisLeuProLeuIleThrGln 77
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         10221 ACGCTGGCCGCACCACGCGCGCGACAAAGTGACCGTGGTGATCACGGTGGATCGTGGC
                                                                                                                                      10386 GACGGCGACGACGAGAGGATGATCGAGAACATCCAGGTCTCCCTGTCTCTGTAT-----
                                                                                                                                                                                                       78 GlnGlnGluGluValLeuAspLysGluGln------ThrGlyPheLeuAlaGlu
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AYAMSLGIAARCLPSLHAPLRYAA'
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IVYWDEGSYTHBGKLDRLRESLTKLDYFSTIDIOPKPEFADDGGCVPVDVKLTRAKRY
YTSGLSGSEGGAGVRGGVERRYVANRGHKMUTQLDYAQNIRKSLTFSKRYDWLD
GWYTASARLYDBOTFSTIDLRNKLTGSRSGGINERWSAIASINALERRWIESSGDDF
GAVYTASCHYGGONIRKLTGSRSGGONIRGHAGANIKGCHYGGLRGDR
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FGLKGGLSGQMQIRARPGREWTANGGLDVRGRYKAYGDDLTTRGQILTWNNNTVSDPR
VSLABERKIGDVTAGIDVSGRAESPRANDVWSEPAMSQSEALSYLVLGRGLSTASSDET
QQVSAASAALSGSILASQIGAKIGLDEAQVSQSSTLGSVVGFGKYLSPKLYVGYGV
SMVGGGSVLTLKYLLSRGFDIEAESSTIETKGSVNMRREK"
COMPLEMENT (8710. .10491)
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LPQINVPLAIQDKTDVQNLRITOLQOPMIVLHKVQGGGLDVARGELERRDLYIDTDMG
DROINVPLAIQDKTDVQNLRITAVLPARGRTPASCLAVRGDLDKMEVAIAGRAPAPL
OASLUFTGRDDPTWARKAVTEALDTSLLIPAAEQDANPPATPIALNLQASGKGGNADL
HGSLKQGELSATLQPSHIALADQVLTVEPLVIDTFEGRTQLRGTADFRDTQNPSFRFA
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located using Blastx/Glimmer/Genemark"
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located using Blastx/Glimmer/Genemark"
                                                                                              /gene="XAC4202"
/note="putative; ORF located using Glimmer/Genemark"
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/protein_id="AAM39039.1"
/db_xref="G1:21110635"
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/transl_table=11
/product_conserved hypothetical protein"
/protein_id="AAM39038 1"
/db_xref="G1:21110634"
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                                                             .4550)
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                             /gene="XAC4202"
complement(4170.
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/transl_table=11
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9477 GCCTCGGCGCGCTGTACGACGAGCAGACCGAGTACATCGACCTGCGCAACGTCAAACTC 9418 9873 GACTACGACTAC--------TTCCGCGATGGCCTGTTCGACCCGCTGGTGTAC 9829 9417 ACCGGCAGCCGCAGCGGCCAGATCAACGAGCGCTGGAGCGCGGATCGCCTCGATCAACGCC 9358 PheGlnProGlyThrProTyrAspLeuAspLeuLeuLeuAspPheGlnGlnAlaLeuGlu 265 GlnAsnGlyHisTyrSerGlyAlaSerValGlnAlaAspPheAspArgLeu-----Gln 283 322 TyrAsnLeuPheAsnLysGlyTyrIleGlySerValValTrpAspMetAspLysTyrGlu 341 342 ThrThrLeuAlaAlaGlyIleSerGlnPro-----ArgAsnTyrArgGlyAsnTyrTrp 359 ---AsnValSerTyr 365 366 AsnArgSerThrThrGlnAsnLeuGluLysArg------376 284 GlyAspArgValProValLysValSerValThrGluValLysArgHisLysLeuGluThr 303 GlyIleArgLeuAspSerGluTyrGlyLeuGly-----GlyLysIleAlaTyrAspTyr 321 GTGAACGCG - - - - - CGCGGCCACAAGATGGACACGCAGCTGGATTACGCGCAGAACCGC AspPheGluIleThrGlyThrGlnArgTyrProGluGlnIleValSerGlyLeuAlaArg 360 Thrser----Qγ

Length: Matches: Conservative: Mismatches:

9.28e-10 291.50 37.32% 23.76% 9.19%

Percent Similarity: Best Local Similarity:

Pred. No.:

Query Match: DB:

Indels:

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23-MAY-2002
section 439
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                                                                                                                       8971
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                                                                                                                                                                                                                                                                                                                                                                                                                                                          Xanthomonas campestris pv. campestris str. ATCC 33913.
Xanthomonas campestris pv. campestris str. ATCC 33913
Bacteria; Proteobacteria; gamma subdivision; Xanthomonas group;
                              9357 TTGCGCGGAGCGTTGGCGTTTCAGCAGCGGCGACGATTTCGAAGGCGCGGTGTACGAGACC 9298
                                                                                        9297 TCCACACTGATCTATCCGCAACTGCAGGCCAACTACGTCAATGTCGACGACGGCTGTTT 9238
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              8970 GACGAATTCGCGCTGGGTGCCAAGAACGTGGTCACCGCCAGTGCCGAATACGAGCATTAC 8911
                                                                                                                                                                                                                                                427 ArgGlnLeuLeuAsnAsnValLeuHisProGluAsnGlyHisTyrLeuAspGlyLysIle 446
                                                                                                                                                                                                                                                                                                             447 GlyThrThrLeuGlyThrPheLeuSerSerThrAlaLeuIleArgThrSerAlaArgAla 466
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AE012531 AE008922
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REFERENCE

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Solva, A.C.R., Ferro, J.A., Reinach, F.C., Farah, C.S., Furlan, L.R., and Silva, A.C.R., Ferro, J.A., Reinach, F.C., Farah, C.S., Furlan, L.R., Rodagol, R.B., Monteiro-Vitorello, C.B., Van Silvay, M.A., Almeida Jr., Alves, L.M.C., do Amaral, A.M., Bertcolini, M.C., Camargo, L.B.A., Capina, L.P., Cicarelli, R.M.B., Coutinho, L.L., Cursino-Santos, J.R., El-Dorry, H., Faria, J.B., Ferreira, R.C.C., Ferro, M.I.T., Formighieri, E.F., Franco, M.C., Gregglo, C.C., Gruber, A., Ratsayama, A.M., Kishi, L.T., Laate Jr., R.P., Lemos, E.G.M., Lemos, W.V. F., Locali, E.C., Machado, M.A., Madeira, A.M.B.N., Martinez-Rossi, N.M., Martins, E.C., Machado, M.A., Namar, C.F.M., Mayaki, C.T., Moon, J.H., Moreira, L.M., Novo, M.T.M., Okura, V.K., Oliveira, M.C., Oliveira, M.C., Oliveira, M.C., Oliveira, M.C., Clasia, A., Sana, J.A.D., Silva, C., de Souza, R.F., Spinola, L.A.F., Truifil, M.A., Truifil, D., Tsai, S.M., White, F.F., Setubal, J.C. and
Camargo, L.E.A., Camarotte, G., Cannavan, F., Cardozo, J., Chambergo, F., Clapina, L.P., Clcarelli, R.M.B., Coutinho, L.L., Cursino-Santos, J.R., Bl-Dorry, H., Faria, J.B., Ferreira, A.J.S., Ferreira, C.C., Ferro, M.I.T., Formighteri, B.F., Franco, M.C., Greggio, C.C., Gruber, A., Katsuyama, A.M., Kishi, L.T., Leite Jr., R.P., Lemos, E.G.M., Lemos, M.V.F., Locali, E.C., Machado, M.A., Madeira, A.M.B., Myaki, C.Y., Moon, D.H., Mortins, E.C., Machado, M.A., Menck, C.F.M., Myaki, C.Y., Oliveira, W.R., Pereira Jr., H.A., Okura, V.K., Oliveira, M.C., Oliveira, V.R., Pereira Jr., H.A., Tamura, R.E., Taita, M.A., Tamura, R.E., Taita, M.H.A., Tandade dos Santos, M.A., Tamura, R.E., Taita, White, F.F., Setubal, J.C. and Kitajima, J.P.
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GROYOLFTVARDGKPOQLOGAGQKSGIYWAPDARTGAKVWSTOVGPGGTTGGVPWGTA
FDDY KSQVYVAINNSSNATYLGPDHYVSHNGGSWAALDAATGKIKWQVKYPGVNSVN
PNVPAGGGGSLTVSFNLLYAGSWAGNWYALDTDTGATLMNYNATGSVISSPAYVDGAL
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Submitted (28-NOV-2001) Departmento de Bioquimica, Universidade
Sao Paulo, Av. Prof. Lineu Prestes 748, Sao Paulo, SP 05508-900,
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/note="putative; ORF located using Glimmer/Genemark"
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33913"
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Complement(2282, ,2587)
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/db_xref="taxon:190485"
/note="pathovar: campestris"
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complement(2282. .2587)
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/gene="xcc4080"
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gene

gene

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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              ANPOMOFGIVDTTMOLRGKVTVPEADIDLERLDRGTSVSEDVVVLDPVDPEAAPASPL
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CDS

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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           FFDEDLKQGLEAMGAGLASYTYQAKLGTVADKVARVAALAEAIAPQVGADPVQARRAA
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  8972 GCGCCGCGCGACGCCAGCGCCTGACCGTGGTGATCACGGTGAACCGTGGCGAGCCGGTG 8913
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              AspAsnValLysThrMetLeuArgSerLysGlyTyrPheSerSerLysValSerLeu--- 115
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     ThrGluLysAspGly-----AlaTyrThrValHisIleThrProGlyProArgThr 132
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    96
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    GluValLeuAspLysGluGln------ThrGlyPheLeuAlaGluGluAlaPro
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            GACGCCGAGATGATCGAGAACATCGAGGTGTCCTTGTCGCTGTAT------
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Conservative:
Mismatches:
Indels:
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24.03%
9.17%
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Query Match:
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153 GluTyrTyrArgAsnAlaLeuGluAsnTrpGlnGlnProValGlySerAspPheAspGln 172

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8685
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8057 TCCACGTGATCCATCCGCAGCTGCACTACGTCGATGACGTCGATGTTC 7998
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               8864 CGCTATCTGGGCCAGGACCTCAAGCAGTTCGAGCCGCGCGAAGGGCAGGTCTTCAGCCAT 8805
                                                                                                                                                                                                                            8684 GATCTGAACTGGGACAGGGGCGCCGCTACGACATGGGCACCGTGCGCTTTGACTACGAT 8625
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               8402 TATGGCAGCGAGAGCGGCGGCGGTGTGCGCGGGGGCGTGGAGCGGCGCTATGTCAAT--- 8346
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             8345 ---TCGCGCGCCACAAGATGGACACGCAGCTGGACTACGCGCAGAACCGCAAGAGCCTG 8289
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       8168 CGCAGTGGC-----CAGATCAACGAGCGCTGGAGTGCGATCGCTTCGATCAACGCC--- 8118
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      CCGCGCAGCGGC-----GTGTCC 7980
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          GGGCAGATGTTCATCCGCGGCGGCGCGCGCGCGCGGGTCGGACACCAATTTCGGTCAG 7920
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    CTCTACGGCCAGCTACGGTGGTTCCTGGGCGCCGCGGGAAT-----GGGCGGGTG 7869
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                                                                                                                                                                                                                                                               229 IleThrGlyThrGlnArgTyrProGluGlnIleValSerGlyLeuAlaArgPheGlnPro 248
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          ValProValLysValSerValThrGluValLysArgHisLysLeuGluThrGlyIleArg 306
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            363 ValSerTyrAsnArgSerThr-----ThrGlnAsnLeuGluLysArgAlaPhe 378
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    379 SerGlyGlyIleTrpTyrValArgAspArgAlaGlyIleAspAlaArgLeuGlyAlaGlu 398
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       AlaThrMetLeuThrAlaSerTrpLysArgGlnLeuLeuAsn-----AsnValLeuHis 435
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               ProGluAsnGlyHisTyrLeuAspGlyLysIleGlyThrThrLeuGlyThrPheLeuSer 455
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         481 IleIleArgGlyGlnAlaGlyTyrThrValAlaArgAspAsnAlaAspValProSerGly 500
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    LeuAspSerGluTyrGlyLeuGly-----GlyLysIleAlaTyrAspTyrTyrAsnLeu 324
                                                                                                                                                  8744 GATGCCGACTTCACCCAGCCCCGGTGGCGTGACGCGTGCCGAGCATGCCGCGCGACATC
                                                                                                                                                                                                                                                                                                                                                                 173 AspSerTrpGluAsnSerLysThrSerValLeuGlyAlaValThrArgLysGlyTyrPro
                                                                                                               LeuAlaLysLeuGlyAsnThrArgAlaAlaValAsnProAspThrAlaThrValAspLeu
                                                                                                                                                                                       AsnValValValAspSerGlyArgProlleAlaPheGly------AspPheGlu
                                                                                                                                                                                                                                                                                                    8624 TAT------TTCCGCCCGGGGCTGTTCGAGCCGCTGTTGGGACGAG
                                                                                                                                                                                                                                                                                                                                         GlyThrProTyrAspLeuAspLeuLeuLeuAspPheGlnGlnAlaLeuGluGlnAsnGly
                                                                                                                                                                                                                                                                                                                                                                                                                 HisTyrSerGlyAlaSerValGlnAlaAspPheAspArgLeu----GlnGlyAspArg
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            PheAsnLysGlyTyrIleGlySerValValTrpAspMetAspLysTyrGluThrThrLeu
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    345 AlaAlaGlyIleSerGlnPro----ArgAsnTyrArgGlyAsnTyrTrpThrSerAsn
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              399 PheLeuAlaGluGlyArgLysIleProGlySerAspIle---AspLeuGlyAsnSerHis
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  8117 TTGCGCGAGCGTTGGCGTTTCAGCAGTGGCAGTGTTTCACCGATGCCGTGTACGAGACC
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         SerThrAlaLeuIleArgThrSerAlaArg---AlaGly--------
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 ------yrPhePheThrProGluAsnLysLeuGlyThrPhe
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               8228 CGCCTGTACGACGAGCAGACCGAATACATCGACCTGCGCAACGTCAAACTCACCGGCAGC
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Nostoc sp. PCC 7120 DNA, complete genome, section 8/19.
AP003588 BA000019
AP003588.1 GI:17131110
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                                                                                                                                                                                                                                                                                         7640 TTCGTCGATAGCGGCAGTGCCTTCGATGACACCCCGGACTGGCGCACC-----GGCATT 7587
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Submitted (02-MAY-2001) Takakazu Kaneko, Kazusa DNA Research
Institute, The First Laboratory for Plant Gene Research; Yana
1532-3, Kisarazu, Chiba 292-0812, Japan
(E-mail: kaneko@kazusa.or.jp,
URL:http://www.kazusa.or.jp/cyanobase/,
Tel:81-438-52-3955(ex.2338), Fax:81-438-52-3934)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Complete genomic sequence of the filamentous nitrogen-fixing cyanobacterium Anabaena sp. strain PCC 7120 DNA Res. 8 (5), 205-213 (2001)
-----LeuAlaGlyProAsnGlySerValLeuProGluArgAlaLeuLeuValGlySer
                                                                                                                         CCGCGCCACGCCCAAGCCGGACGAATTCGCGCTGGGTGCCAAGAACGTGGTCACGGCCAGC
                                                                                                                                                                                                            PheHisAspMetGlyAspAlaAlaAlaAsnPheLysArgMetLysLeuLysHisGlySer
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complement(761, 3619)
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similar to nitrile hydratase"
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COMPLEMENT (6028 . 7395)
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ASGIY*
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CDS	Alignment Sr Pred. No.: Score: Percent Sim Best Local (Query Match	US-09-857- QY 81	3189	Oy 101 Db 319039	Oy 107 Db 319099	Oy 119 Db 319158	Oy 138	15 15	DD 319218 QY 170	Db 319278 Ov 182	31933	Qy 200 Db 319398	Qy 215 Db 319449	Qy 221 Db 319509	Oy 241 Db 319542	Qy 261 Db 319602	Оу 281

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ි සි	320004	GCAAGACCGTCTCGTGTCACCTCTAGGTGGTGTGTTACCTTCACCCGCCCTCTATC	~ ~
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Caulobacter crescentus CB15 section 161 of 359 of the complete
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1 (bases 1 to 10301)
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Potocka, I., Nelson, W.C., Newton, A., Stephens, C., Phadke, N.D.,
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Submitted (31-JAN-2001) The Institute for Genomic Research, 9712
Medical Center Dr., Rockville, MD 20850, USA
Location/Qualifiers
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Caulobacter crescentus CB15.
Caulobacter crescentus CB15
Bacteria; Proteobacteria; alpha subdivision; Caulobacter group;
586 eSerPheAspIleAlaTyrGly---HisSerAspLysLysIleArgTrpHisIleSerLe
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Complete genome sequence of Caulobacter crescentus
Proc. Natl. Acad. Sci. U.S.A. 98 (7), 4136-4141 (2001)
21173698
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83. .439
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/db_xref-"GI:13422996"
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DLGRSKSLRLVADATEANGGAIAGALGLPADRTFDLKAKAEGTASRAAFDVVARSGRE
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4661 GGGCGCTCCGCCGACGTGGTCGGCGCCGAGGCCGGATCGTCGCCCAGGTGGCCAAGCTC 4720

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VSRIGGONDAKLSVRWRKDY 3692 g O 1623 BASE COUNT ORIGIN

GTTCGCCCGACCTTCAGGATCATGCCGGCGAGCTGCTTCTGAACGGCGTTGATGTC 4840 5419 5452 5629 GECAAGCTGGGCGCGATCTTGGGCGCCGGGCTTCTCGATGTTCCGGCGCTCCCGGCGCTTC 5689 TCGGACAACACGCCCACAAGGGGGTATT-----TCACTGGTCGAGACCTCGTTT 5797 841 GTCACCAAGGGGCGCACCAATCCCGAATGGGTCGGCCGTCTCGCGCCCTGGGTGGCCGGT 4900 1961 TATGACTCGATCTCGGTTTCGCTCGCGGGACCGACAAGGCTTCGGCCGAGGCTATCGG 5020 TATTCGACCAGCGAAGGCGCCCGCGCGCTCGATCGCCCTGGATCCGCTATAACCGCCAGAAG 5137 GAAATCTCACTGCCG----------CACTGGCGGCGACCGCAGCACCTTG 5239 5240 AAGCTGAACAGCTCGGTCTTCCGCAACGACACCGACGCCTACAACGAAACCGGGGCCACG 5299 503 ValProValLysValSerValThrGluValLysArgHisLysLeuGluThrGlyIleArg 306 LeuAspSerGluTyrGlyLeuGlyGlyLysIleAlaTyrAspTyrAsnLeuPheAsn 326 GlyGlyIleTrpTyrValArgAspArgAlaGlyIleAspAlaArg---LeuGlyAlaGlu 398 406 IleProGlySerAspIleAspLeuGlyAsnSerHisAlaThrMetLeu---ThrAlaSer 424 TrpLysArgGlnLeuLeuAsnAsnValLeuHisProGluAsnGlyHisTyrLeuAspGly 444 ArgSerGlyGlyAlaSerSerValArgGlyTyrGluLeuAspSerIleGlyLeuAla... 522 GluTyrGlnLeuProPheThrArgThrLeuSerGlyAlaValPheHisAspMetGlyAsp 559 LysileGlyThrThrLeuGlyThrPheLeuSerSerThrAlaLeuileArgThrSerAla 464 250 ThrProTyrAspLeuAspLeuUeuAspPheGlnGlnAlaLeuGluGlnAsnGlyHis 5300 GTCGGCGTCGATCTGACCCGCCGACGCCAGACGGCGTATCGCACCTTCGGGGTCTCA TTCGACCTCTCGCAGACCAAGGAGCAGGTCAATCGCAACGGCTTGATCGCCGGGGGAAG GACGTCTATGATCCGGAAGATGTCGCCGAGCTGGAGCGCCGACTGCGCGACACCGCCGTT ---ccggrggrcgrcacccrgrccacaggcggcgcacgarcgaacrggcgggc LysGlyTyrIleGlySerValValTrpAspMetAspLysTyrGluThrThrLeuAlaAla CGCGCCGACACGACATATGCGCTGCGGTTCGCCAAGCTGGAACAACGGCTTGGCGCA GlyIleSerGlnProArgAsnTyrArgGlyAsnTyrTrpThrSer------------AsnValSerTyrAsnArgSerThrThrGlnAsnLeuGluLysArgAlaPheSer Phe------LeuAlaGluGlyArgLys ArgAlaGlyTyrPhePheThrProGluAsnLysLysLeuGlyThrPheIle...IleArg GlyGlnAlaGlyTyrThrValAlaArgAspAsnAlaAspValProSerGlyLeuMetPhe TTCTCCGGCGGCGCGCTTCGGTGCGAGGCTACGCCTATCAGGCGATCGGCCCGCGCTTG -----GlyProAsnGlySerValLeuProGluArgAlaLeuLeuValGlySerLeu ThrGlyThrGlnArgTyrProGluGlnIleValSerGlyLeuAlaArgPheGlnProGly TyrSerGlyAlaSerValGln --- -- AlaAspPheAspArgLeuGlnGlyAspArg 4781 4901 5078 5138 5198 5360 5420 425 5453 5573 540 230 270 287 5021 307 347 380 399 484 504 327 362 445 465

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Score: 260.50 Matches: 145 Percent Similarity: 36.58 Conservative: 86 Best Local Similarity: 22.948 Mismatches: 245 Query Match: 8.218 Indels: 157 DB: 1 Gaps: 28 US-09-857-669-2 (1-609) x NGU81959 (1-2379)	86 GluGlnThrGlyPheLeualaGluGlualaProAspAsnValLysThrMet		Db 745 GACAAAACCAGGCAGACCATCAAAATCACCGTCCACGAAGGCGGACGTTCCGCTGGGGC 804 Qy 136 ASBValGlyValAlaileLeuGlyAspileLeuSerAspGlyAsBLeuAlaGluTyTTyr 155	Db 841 AAGGCCGAACTGGAAAAACTGCTGACCATGAAGCCCGGCAAATGGTACGAA 891 Qy 168 SerAspPheAspGlnAspSerTrpGluAsnSerLysThrSerValLeuGlyAlaValThr 187 Db 892	Oy 188 ArgLysGlyTyrProLeuAlaLysLeuGlyAsnThrArgAlaAlaVal 203 ::: ::::::::: Db 928 AACCGCATGGGCTCGGCAGCTACAGCGATACAGCGTACAGCCGTGCCG 984	Qy 204 AsnProAspThrAlaThrValAspLeuAsnValValAspSerGlyArgProIleAla 223	Oy 224 PheGlyAspPheGluIleThrGlyThrGlnArgTyrProGluGlnIleValSerGlyLeu 243 ::: :::::::::::::::::::::::::::::::	Oy 244 AlaArgPheGlnProGlyThrProTyraspLeuaspLeuLeuLeuAspPheGlnGlnAla 263	Qy 264 LeuGlüGlnasnGlyHisTyrSerGlyAlaSerValGlnAlaAspPheaspArgLeuGln 283 ::: <t< th=""><th>322 TyrAsnLeuPheAsnLysGlyTyrIleGlySerValValTrpAspMetAspLysTyrGlu 341 </th><th>Oy 362ArgSer 368 ::::: ::: :: </th></t<>	322 TyrAsnLeuPheAsnLysGlyTyrIleGlySerValValTrpAspMetAspLysTyrGlu 341	Oy 362ArgSer 368 ::::: ::: ::
5798 GAGGTGCGCCAGAAGATCACCGATCGCTGGACGGCGTTCGTCGATGCGGGCGCT 5857 560 AlaalaalaasnPheLysargMetLysLeuLysHisGlySerGlyLeuGlyVal 577 :::	5918 CGTTACGATCTGGGCTTTGGACCGATCCGGGCCGCCGCCGCCGCCGCGCGCG	DB 59/8 ANGGCGACCCGAAGTTCCAGCATCGGGCAAAGCTTT 6025 RESULT 35 NGUB1959 NGUB1959 2379 bp DNA linear BCT 24-JAN-2002 DEFINITION Neisseria gonorrhoeae outer membrane protein (omp85) gene, complete	ACCESSION U81959 VERSION U81959.1 GI:1766041 KRYWORDS Neisseria gonorrhoeae. ORGANISM Neisseria gonorrhoeae Bacteria; Proteobacteria; beta subdivision; Neisseriaceae;	Nelsseria. 1 (bases Manning, D. Omp85 prot are simile multocida	JUDKNAL MICTOD, Pathog. 25 (1), 11-21 (1998) MEDLINE 98379445 PUBMED 9705245 REFERENCE 2 (bases 1 to 2379) AUTHORS Reschke, D. K., Manning, D. S. and Judd. R.C.	TITLE Direct Submission JOURNAL Submitted (11-DEC-1996) Division of Biological Sciences, University of Montana, Health Sciences 104, Missoula, MT 59812-1002, USA Location/Onalifiers	rce	gene 1. 2379 1 . 2379 CDS 1. 2379 (Annual Annual An	/optine="Omp65" //codon_start=1 //transl_tabhe=1 /product="outer membrane protein" /product="outer membrane protein" /protein_id="AAC17600.1" /protein_id="MKLKQ18ALMMLG1SPLAFADFT1QD1RVGGLQRTEPSTVFNY LPVKVGDPYANDTHGSALIKSIKATGFPDDVRVEFADGLLLLTVVVCPTGSLWITGAK MLQNDAIKKNIESFGLAQSQYFNQATLWQAVAGIKEEYLGGTKGKINIQITPKVTKLARN RVD1D1T1DEGKSAKITP1EFEGNOVYSDRKHRQWSLTEGGTWATTRSCBFRARN RVD1D1T1DEGKSKAKITP1EFEGNOVYSDRKHRQWSLTEGGTWATTRSCBFRARN ADWEKYTDFYQNNGYPDFRFLLDTD1OTNEDRIKRGNGTKGTKINIGTTPKVTKLARN		BASE COUNT 636 a 752 c 592 g 399 t ORIGIN Alignment Scores: 1.55e-08 Length: 2379

Neisseria

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III:: ACCAG	11	GTTAC	TACAA	SerAs	CCAGA	Lysar 	92999	iledi	AlaGl	CTGCA	ThrPh	ACGCT	Prose	Sori	ACGCT	Serva	1	Й	AAAGA		AGAAC		ProLe	CCTTTG	Lysil	ATCCA		
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1165 GTCGAGCTTTTGGGCTACTTCGAC -----AACGTACAGTTTGATGCCGTCCCGCTTGCC 1218
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   626 GAAGCGACCGGTTCGACCGCCAGAATTCGCCCAAGACATGGAAAAAGTAACCGACTTCT 685
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          686 ACCAGAACAAC-GGCTACTTCGATTTCCGTATCCTCGATACCGACATCCAAACCAAACGAA 744
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    136 AsnValGlyValAlaileLeuGlyAspIleLeuSerAspGlyAsnLeuAlaGluTyrTyr 155
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 224 PheGlyAspPheGluIleThrGlyThrGlnArgTyrProGluGlnIleValSerGlyLeu 243
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1 (bases 1 to 2379)
Giuliani,M.M., Pizza,M., Rappuoli,R. and Holst,J.
Giuliani,M.M., Pizza,M., Rappuoli,R. and Holst,J.
Biskda neisserial antigan
Patent: WO 0138350-A 6 31-MAY-2001;
Chiron Spa (IT); Statens Institutt for Folkehelse (NO)
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/organism="Neisseria meningitidis"
/db_xref="taxon:487"
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                ò
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a č	1279 GACTIGAGCGCGGGGCTGGGTTGGGGGTTGGTGTCGGCGGGCGTATGGCAG 1338 322 TyrasnLeuPheAsnLysGlyTyrIleGlySerValValTrpAspWetAspLysTyrGlu 341	Qy 598 LysileArgTrpHisileSerLeuGlyThrArgPhe 609
92	GACAACCTGTTCGGTACGGGCAAGTCGGCCCCTGCGCGCCTTCGCGAAAAAAAAAAA	
Qy Db	342 ThrThrLeualaalaGlyIleSerGlnProArgAsnTyrArgGlyAsnTyrTrpThrSer 361 1393 ACCACGCTCAACGGCTCGCTGTCGTTTACCGACCCGTACTTCACGGCA 1440	RESULF 37 AX202493 LOCUS AX202493 LOCUS DEFINITION Sequence 6 from Patent WO0152885.
6 Q	362AsnValSerTyrAsn	ACCESSION AX202493 VERSION AX202493.1 GI:15392216 KEYWORDS Neisseria gonorrhoeae.
ò 5	1 5	_
5 5	recroses controlled to the control of the control o	TELEGRANCE I (DGSSS I LO 23/9) AUTHORS Pizza,M.C., Rappuoli,R.C. and Giuliani,M.C. TITLE Outer membrane vescile (omv) vaccine comprising N. meningitidis serogroup b outer membrane proteins
g &	1561 GTTACCGAATACGACGGGGTCAATTTCGGGCTGGCGGGGGAACACCTGACGTCAACAC 1620 394ArgLeuGlyalaGluPheLeualaGluGlyArqLysIleProGly 408	JOURNAL Patent: WO 0152885-A 6 26-JUL-2001; Chiron Spa (IT) FEATURES Location/Qualifiers
q	1621 TACAACAAAGCACCCAAAGGCTATGCCGACTTTATCAGGAAATACGGCAAAAACCGACGGC 1680	rce
Q Dp	409 SeraspileaspLeuGlyasnSerHisAlaThrMetLeuThralaSerTrp 425 :::	/dD_XTEL="taxon:463" BASE COUNT 636 a 755 c 596 g 392 t ORIGIN
δ		Alignment Scores: 2.87e-08 Length: 2379 Pred. No.: 256.50 Matches: 144
Q		larity: 36.39% Conservative:
Oy P	446 IleGlyThrThrLeuGlyThrPheLeuSerSerThrAlaLeuIleArgThrSerAlaArg 465 1783	8.08% Indels: 6 Gaps:
3 8	LOT AT THE TAY TO THE	US-09-857-669-2 (1-609) x AX202493 (1-2379)
5 A	CTGCAATACTACTCCGCCACCCACAACCTGGTTCTTCCCCTTAAGCAAAACCTTC	86 GluGlnThrGlyPheLeuAlaGluGluAlaProAspAsnValLysThrMet
δ	479 ThrPheileileArgGlyGlnAlaGlyTyrThrValAlaArgAspAsnAlaAspVal 497	Db 626 GAAGCGACTCCACCCCAGAAATTCGCCCAAGACATGGAAAAGTAACCGACTTCT 685 Ov 103 LenargSerlosGlyTurpheSerSerlosGalserlenthrdlu 117
Q .	ACGCTGATGCTCGGCGGCGAGTCGGCGTTGCGGGCGGCTACGGCAGAACCAAAGAAATC	686 ACCAGAACAAC-GGCTACTTCGATTTCCGTATCCTCGATACCGACAACCAAC
g ç	498 ProSerGlyLeuMetPheArgSerGlyGlyAlaSerSerValArgGlyTyrGluLeuAsp 517 1111 1111 1	Qy 118 LysAspGlyAlaTyrThrValHisileThrProGlyProArgThrLysIleAla 135
ογ	SerlleGlyLeuAlaGlyProAsnGly	Db 745 GACAAAACCAGGCAGACATCAAAATCACCGTCCACGAAGGCGGACGTTCCGCTGGGGC 804
Q O		Qy 136 AsnvalGlyvalAlaileLeuGlyAspileLeuSerAspGlyAsnLeuAlaGluTyrTyr 155
ò	SerValLeuProGluArgAlaLeuLeuValGlySerLeuGluTyrGlnLeuPro	156 ArgAsnAlaLeuGluAsnTrpGlnGlnProValGly
g :	AAAAAAGCCAACGTCTCCGCCGAGCTGCTTCCCGATGCCCGGTGCG	841
දු ද	545Pherintal Control of the Cont	Qy 168 SerAspPheAspGlnAspSerTrpGluAsnSerLysThrSerValLeuGlyAlaValThr 187
ò	}	Db 892
q ₀	AGAACCTATACCGCCGCCGAAAACGGTAACAACAATCGGTTTACTCGGAAAACGCGTT	188 ArgLysGlyTyrProLeuAlaLysLeuGlyAsnThrArgAlaAlaVal
ογ	568	DD 928 AACCGCATGGGCTCGGCAGGCTACGCAAAATCAGCGTACAGCGCTGCCG 984 Ov 204 AsnDroAsnThralaThrValasnIcalWalValValValValValVarGPrG1vArgPrG1jeala 223
a		11 1 1 1 1 1 1 1 1 1
P 03	582 ProLeualaProPheSerPheAspIlealaTyrGlyHisSerAspLys 597 	Qy 224 PheGlyAspPheGluIleThrGlyThrGlnArgTyrProGluGlnIleValSerGlyLeu 243

9	1045 GTCAACGAAATCCACATCACCGGCAACAAAACCCGCGACGAAGTCGTGCGCGCGGAA 1104	4
δ	244 AlaargPheGlnProGlyThrProTyrAspLeuAspLeuLeuLeuAspPheGlnGlnAla 263	QY 545PheinrArgingLine
qq	1105 TTGCGCCAAATGGAATCCGCGCCTTACGACACCTCCAAGCTGCAACGCTCCAAAGAGGGC 1164	
δ	LeuGluGlnAsnGlyHisTyrSerGlyAlaSerValGlnAlaAspPheAspArgLeuGln:::	Qy 560AlaA Db 2161 AGAACCTATACCGCCG
QQ	1165 GTCGAGCTTTTGGGCTACTTCGACAACGTACAGTTTGATGCCGTCCCGCTTGCC 1218	895 AO
oy Og	284 GlyAspArgValProValLysValSerValThrGluValLysArgHisLysLeu 301 	7
ò	302 GluThrGlylleArgLeuAspSerGluTyrGlyLeuGlyGlyLlyslleAlaTyrAspTyr 321	
QQ	::: 1279 GACTTGAGCGCGGGCTGGGGTTCAGGATACCGGCTTGGTCTGTCCGCGGGGGTATCGCAG 1338	
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3 3	342 ThrThrLeuAlaAlaGly1leSerGlnProArqAsnTyrArqGlyAsnTyrTrpThrSer 361	RESULT 38 AX155447
Dp		_
ογ	362AsnValSerTyrAsn	ACCESSION AX155447 VERSION AX155447.1 GI
qq	1441 GACGGGGTCAGCCTACGGTATTTACGGAAAAGCCTTCGACCCGCGCAAAGCATCG 1500	
ογ	369 ThrThrGlnAsnLeuGluLysArgAlaPheSerGlyGly 381 :::	OKGANISM Neisseria gono Bacteria; Prot- Neisseria.
qq	1501 ACCAGCGTCAAACAATATAAAACCACCACCGGGGGGGGGG	REFERENCE 1 (bases 1 to
οy	382IleTrpTyrValArgAspArgAlaGlyIleAspAla 393	TITLE 85kda neisseri JOURNAL Patent: WO 013
g	1561 GTTACCGAATÁCGACCGCGTCAATTTCGGCCTGGCGGGGAACACCTGACCGTCAACACC 1620	
ογ	394	source 12
g	1621 TACAACAAAGCACCCAAACGCTATGCCGACTTTATCAGGAAATACGGCAAAACCGACGGC 1680	655
ò	SerAspileAspLeuGlyAsnSerHisAlaThrMetLeuThrAlaSerTrp ::: :::	,
<u>අ</u>	1681 GCAGACGGCAGCTTCAAAGGCCTGCTGTACAAAGGCACCGTCGGCTGG 1728	Alignment Scores: Pred. No.:
ò	426 LysargGlnLeuLeuAsnasnAsnValLeuHisProGluAsnGlyHisTyrLeuAspGlyLys 445	Score: 25 Percent Similarity: 36
ò	446 IleglyThrThrLeuGlyThrPheleuSerSerThrAlaLeuTleArgThrSerAlaArg 465	
- A	1783GTAAATGCCGAAATCGCCTGCCCGGCAGAAA 1815	09-857-669-2 (1-609)
ò	466 AlaGlyTyrPhePheThrProGluAsnLysLysLeuGly 478	Qy 41 SerProAspThrGlus
qq	1816 CTGCAATACTGCGCCACCCACAACCAAACCTGGTTCTTCCCCTTAAGGAAACCTTC 1875	Db 470 TCGCCCGCAACCGCGT
0y		Oy 54 ProVal-ArgileAsp
Q	1876 ACGCTGATGCTCGGCGGCGAAGTCGGCATTGCGGGCGGCTACGGCAGAACCAAAGAAATC 1935	Db 530 CCGACATCGAATTTGA
oy ob	498 ProSerGlyLeuMetPheArgSerGlyGlyAlaSerSerValArgGlyTyrGluLeuAsp 517 1	Oy 73 oLeulleThrGlnGln ::::: Db 590 CGCTGACCGAAGGCGG
ò	518 SerIleGly	Oy 93 uGlualaProAspAsn
qq	::::: 1996 ACGTCGGCCCGAAAGTGTATGACGAAATACGGCGAAAAATCAGGTACGGCGGCAAC 2052	650
ολ	ServalL	Oy 110SerSe
qq	2053AAAAAAGCCAACGTCTCCGCCGAGCTGCTTTCCCGATGCCCGGTGCG 2100	bb 710 TCCGCATCCTCGATAC

linear PAT 22-JUN-2001 CCGAAAACGGTAACAACAATCGGTTTACTCGGAAAACGCGCAT 2220 --LysLeuLysHisGlySerGlyLeuGlyValArgTrpPheSer 581 euSerGlyAlaValPheHisAspMetGlyAsp------ 559 laAlaAsnPheLysArgMet------567 erPheAspIleAlaTyr-----GlyHisSerAspLys 597 AGGCAACCAAGTCTATTCCGACCGCAAACTGATGCGGCAGATGT 589 rLysValSerLeuThrGluLysAspGlyAlaTyrThrValHisi 126 GlnGluGluValLeuAspLysGluGlnThrGlyPheLeuAlaGl 93 erValLysLeuLys-----53 ThrGlnAspSerGluIleLysAspMetValGluGluH1sLeuPr 73 rrhoeae eobacteria; beta subdivision; Neisseriaceae; al antigen 18350-A 10 31-MAY-2001;); Statens Institutt for Folkehelse (NO) 1904-Pizza, M., Rappuoli, R. and Holst, J. Length:
Matches:
Conservative:
Mismatches:
Indels:
Gaps: nism="Neisseria gonorrhoeae" ref="taxon:485" 58 c 586 g 395 t leSerLeuGlyThrArgPhe 609 ||||||||||| rccAgcTcGGCACGACGTTC 2376 DNA 2394 bp om Patent WO0138350. AX155447 (1-2394) :14536772 rrhoeae. 61e-08 53.50 5.50% 2.04% 2394)

oy Ob	126	leThrProGlyProArgThrLysIleAlaAsnValGlyValAlaIleLeuGlyA 	144 816
οy	144	H	160
qq	817	GAAGGGACACCAACGAAGTCCCCAAAGCCGAACTGGTGA	865
δλ	161	AsnTrpGlnGlnProValGlySerAspPheAspGlnAspSerTrpG	176
g	998	CCATGAAGCCCGGCAAATGGTACGAA	892
ò	176	luAsnSerLysThrSerValLeuGlyAlaValThrArgLysGlyTyrP	192
qq	893	GCCAGCAGATGACCGCCGTTTTGGGTGAGATTCAGAACCGCATGGGCTCGGCAGGCTACG	952
ογ	192	roLeualaLysLeuGlyAsnThrArgAlaAlaValAsnProAspThrAlaThrValAspL	212
qq	953	CATACAGCGAAATCAGCGTACAGCGGCTGCCAAACGCCGAAACCGACGTCGATT	1009
ογ	212	euAsnValValValAspSerGlyArgProlleAlaPheGlyAspPheGlulleThrGlyT	232
ą	1010	TCGTCCTGCACATCGAACCGGGCCGGAAAATCTACGTCAACGAAATCCACATCACCGGCA	1069
ò	232	hrGlnArgTyrProGluGlnIleValSerGlyLeuAlaArgPheGlnProGlyThrProT	252
q	1070	ACAACAAAACCCGCGACGAAGTCGTGCGCCGCGAATTGCGCCCAAATGGAATCCGCGCCTT	1129
ογ	252	yraspLeuAspLeuLeuLeuAspPheGlnGlnAlaLeuGluGlnAsnGlyHisTyrSerG	272
g	1130	ACGACACCTCCAAGCTGCAACGCTCCAAGCGCGTCGAGCTTTTGGGCTACTTCGAC-	1188
ò	272	lyalaServalGlnAlaAspPheAspArgLeuGlnGlyAspArgValProValL	290
q	1189	AACGTACAGTTTGATGCCGTCCCGCTTGCCGGCACACCCGACAAAGTCGATTTGA	1243
ò	290	ysValSerValThrGluValLysArgHisLysLeuGluThrGlyIleArgLeuAspSerG	310
q	1244	ACATGAGCCTGACCGAACGTTCCACCGGCTCGCTCGACTTGAGCGCGGGCTGGGTACAGG	1303
ó	310	luTyrGlyLeuGlyGlyLysIleAlaTyrAspTyrTyrAsnLeuPheAsnLysGlyTyrI	330
qq	1304	ATACCGGCCTGGTCATGTCCGCAGGCGTTTCCCAAGACAACCTGTTCGGTACGGGC	1359
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qq	1360	AAGTCGGCCGCCCTGCGCGCCTCACGAAGCAAAACCACGCTCAAAGGCTGTCGT	1417
ò	345	AlaAlaGlyIleSerGlnProArgAsnTyrArgGlyAsnT	358
g	1418	TTACCGACCCGTACTTCACGCGCGAGACGGGGTCACGGGTTTTACGGAAAAG	1477
δ	358	yrTrpThrSerAsnValSerTyrAsnArgSerThrThrGlnAsnL	373
q	1478		1537
δ	373	euGluLysaArgAlaPheSerGlyGlyIleTrpTyrValArgAspArgAlaGlyIleAspA	393
q	1538	CAGGCATCCGCATGAGCGTGCCTGTTACCGAATACGACGCGCGTGAATTTCGGTTTGGTGG	1597
δλ	393	laArgLeuGlyAlaGluPheLeuA	401
qq	1598	CAGAACACCTGACCGTCAACACCTACAACAAGGGGCCCAAACACTATGTCGGAACTTTATCA	1657
ογ	401	AspLeuGlyAsnSerHisAlaThr	421
q	1658	ļ	1708
δy	421	euThrAlaSerTrpLySArgGlnLeuLeuAsnAsnAsnValLeuHisProGluAsnG	439
đ	1709	ACAAAGGT	1768

	t Scores:	Alignment	K
	655 a	BASE COUNT ORIGIN	B O
	rce 1. 2394 /organism="Neisseria meningitidis" /db.xref="taxon:487"	sour	
	6	EATURES	1
tidis	1 (bases 1 to 2394) Pizza,M.C., Rappuoli,R.C. and Giuliani,M.C. Outer membravesicle (omv) vaccine comprising N. meningi serogroup b outer membrane proteins Patent: WO 0152885-A 10 26-JUL-2001;	REFERENCE AUTHORS TITLE JOURNAL	œ
		OURCE	S
-AUG-200	AX202497 2394 bp DNA 11near PAT 30 Sequence 10 from Patent WO0152885. AX202497.1 GI:15392217	RESULT 39 AX202497 LOCUS DEFINITION ACCESSION KEYWORDS	K K Y U U Y X
	5 lyThrArgPhe 609 GCACGACGTTC 2391	y 606 b 2381	ο <u>γ</u>
2380	~	b 2321	g
909		y 590	ò
2320		7	. d
2260		b 2201	g .
570)	у 560	οy
2200	CAGGCAGCGTGTGGACGAGACGACGACAACAACAGCAGTTCCGCGACCGGCGCACA	b 2141	qq
559	etG	y 557	ò
557 2140	<pre>1 LuTyrGlnLeuProPheThrArgThrLeuSerGlyAlaValPheHlSASpM ::: ::: </pre>	y 540 b 2081	Oy Dp
2080	TCAGCTACGCCGCCAAC	b 2036	g
540	LeuAlaGlyProAsnGlySerValLeuPr	y 521	òγ
2035		o 1976	QΩ
520		y 511	οy
511 1975	<pre>? rgAspAsnAlaAspValProSerGlyLeuMetPheArgSerGlyGlyAlaSerSerV</pre>	y 492 o 1916	g G
1915		0 1856	QQ
492	5bysLeuGlyThrPheIleIleArgGlyGlnAlaGlyTyrThrValAlaA	476	ò
1855	::	0 1796	οp
475			δ
1795			8
409		439	ô

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Page

ολ	330	GlySerValValTrpAspMetAsp
QΩ	1360	AAGTCGGCCGCCCTGCGCGCCTCACGAAAACCACGCTCACGCTCGCT
δ	345	358 111 111 111 111 111 111 111 111 111 1
Ωp	1418	H
οy	358	yrTrpThrSerAsnValSerTyrAsnArgSerThrThrGlnAsnL 373
ф	1478	CCTTGGACCCGCGCAAAGCATCGACCAGCATCAAACAATATAAAACCACCACGCAGGCG 1537
ογ	373	euGluLysArgAlaPheSerGLyGlyIleTrpTyrValArgAspArgAlaGlyIleAspA 393
ΩD	1538	CAGGCATCGCATGAGGGTGCCTGTTACCGAATACGAGCGTGAATTTCGGTTGGTGG 1597
ογ	393	la
qq	1598	CAGAACACCTGACCGTCAACACCTACAACACAAGCGCCCAAACACTATGCCGACTTTATCA 1657
οy	401	laGluGlyArgLysIleProGlySerAspIleAspLeuGlyAsnSerHisAlaThrMetL 421
qa	1658	AGAAATACGGCAAAACCGACGCGCACACGGCAGCTTCAAAGGCTGGCTGT 1708
ογ	421	euThralaSerTrpLysArgGlnLeuLeuAsnAsnValLeuHisProGluAsnG 439
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δy	439	lyThrThrLeuGlyThrPheLe
qq	1769	-TACCTGACGGC
ογ	459	eulleArgThrSerAlaArgAlaGlyTyrPhePheThrProGluAsnLys475
q	1796	TCGCCCTGCCCGGCAGCAAACTGCAATACTACTCCGCCACCACAAACCAAACCTGGTTCT 1855
δy	476	LysLeuGlyThrPheIleIleArgGlyGlnAlaGlyTyrThrValAlaA 492
qq	1856	TCCCCTTAAGCAAAACCTTCACGCTGATGCTCGGCGGCGAAGTCGGCATTGCGGGGGGGCGCT 1915
δy	492	rgAspAsnAlaAspValProSerGlyLeuMetPheArgSerGlyGlyAlaSerSerV 511
g	1916	ACGGCAGAACCAAAGAAATCCCCTTCTTTGAAAACTTCTACGGCGGGGGCCTGGGTTCGG 1975
ογ	511	alargdlyTyrGluLeuAspSerIleGly520
qq	1976	TGCGGGGTACGAAAGCGGCACGCTCGGTCCGAAAGTGTATGACGAAATACGGCGAAAAAA 2035
Oy	521	Σ.
Ор	2036	TCAGCTACGGGGCAACAAAAAAAGCCAACGTCTCCGCCGAGCTGC 2080
ογ	540	luTyrGlnLeuProPheThrArgThrLeuSerGlyAlaValPheHisAspM 557
οg	2081	CGAAAGACGCGCGCACCGTCCGC
οy	557	etGlyAsp559
Ωp	2141	CAGGCAGCGTGTGGGACGGCAAAACCTACGACGACAACAGCAGTTCCGCGACCGGCGGCA 2200
Qy	260	
Op	2201	GGGTTCAAAACATTTACGGCGCCGGCAATACCCATAAATCCACCTTTACCAACGAATTGC 2260
οy	570	ysHisGlySerGlyLeuGlyValArgTrpPheSerProLeuAlaProPheSerPheAspI 590
QΩ	2261	GCTATTCCGCCGGCGGGGGGTTACCTGGCTCTCGCCTTTAGGCCCGGATGAATTCAGCT 2320
ογ	590	leAlaTyrGlyHisSerAspLysLysItArgTrpHisIleSerLeuG 606
qq	2321	ACGCCTACCCGCTGAAGAAAAAAACGGAAGAATCCAACGCTTCCAATTCCAACTCG 2380

606 lyThrArgPhe 609

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Mary M

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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   /gene-"NMA0004"
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NDGEEVFAVMDGEVDMHYRENGEEHIVRLKSGDIFYAGIGTEHVAHPRGETRILVIEK
                                                                                                 BCT 04-DEC-2000
                                                   Nelsseria meningitidis serogroup A strain Z2491 complete genome; segment 1/7. AL162752 AL157959
                                                                                                                                                                                                                                                                                                                                                                Parkhill, J. Achtman, M. James, K.D., Bentley, S.D., Churcher, C., Klee, S.R., Morelli, G., Basham, D., Brown, D., Chillingworth, T., Davis, R.M., Davis, P., Devlin, K., Feltwell, T., Hamlin, N., Holroyd, S., Jagels, K., Leather, S., Moule, S., Mungall, K., Quall, M.A., Rajandream, M.A., Rutherford, K.M., Simmonds, M., Skelton, J., Whitehead, S., Spratt, B.G. and Barrell, B.G. Complete DNA sequence of a serogroup A strain of Neisseria
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Details of N. meningitidis sequencing at the Sanger Centre are available on the World Wide Web. (URL, http://www.sanger.ac.uk/Projects/N_meningitidis/). Location/Qualifiers
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Submitted (30-MAR-2000) Submitted on behalf of the Neisseria sequencing team, Sanger Centre, Wellcome Trust Genome Campus, Hinxton, Cambridge CB10 ISA E-mail: parkhill@sanger.ac.uk
                                                                                                                                                                                                                                               Neisseria meningitidis 22491.
Neisseria meningitidis 22491
Bacteria; Proteobacteria; beta subdivision; Neisseriaceae;
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/organism="Nelsseria meningitidis 22491"
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complement(414. 2438)
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         /strain="22491"
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2381 GCACGACGTTC 2391
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                                                                                               LOCUS
DEFINITION
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PUBMED
REFERENCE
AUTHORS
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JOURNAL
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AUTHORS
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KEYWORDS
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84511 CCGACATCGAATTTGAAGGCAACCAAGTCTATTCCGACCGCAAACTGATGCGGCAGATGT 84570

OLEUIleThrGlnGlnGlnGluGluValLeuAspLysGluGlnThrGlyPheLeuAlaGl

73

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qq

Proval-ArgileAspThrGlnAspSerGluIleLysAspMetValGluGluHisLeuPr

54

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qq

73

84630

93

84690

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84571 CGCTGACCGAAGGCGGCATTTGGACATGGCTGACACGAAGCAACCAATTCAACGAGCAGA

84750

leThr-----ProGlyProArgThrLysIleAlaAsnValGlyValAlaIleLeuGlyA

126

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-----SerSerLysValSerLeuThrGluLysAspGlyAlaTyrThrValHisI

110

ò

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93 84631

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qq

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/RC_number="1.6.5.3"
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223 aa; similar to many e.g. NUOJ_RHOCA NADH dehydrogenase
I chain J (EC 1.6.5.3) (202 aa), fatsa scores; E():
9.7e-21; 41.3% identity in 201 aa overlap. Contains Pfam
match to entry PF00499 oxidored_q3,
NADH-ubiquinone/plastoquinone oxidoreductase chain 6"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          /product="NabH dehydrogenase I chain J"
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EEGRA"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              LWMLMQAEFLGVTLVVVYVGAVMVLFLFVVMMLNIDIEEMRAGFWRHAPVAGVVGTLL
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                                                                                                                                                                                                                                                                                                                                                                                                                                          /note="Pfam match to entry PF00420 oxidored_q2,
NADF-ubjquinone/plastcquinone oxidoreductase chain 4L,
score 14.1.50, E-value 1.5e-38"
complement(3863. .4534)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    /note="Pfam match to entry PF00499 oxidored_q3, NADH-ubiquinone/plastcquinone oxidoreductase chain 6, score 77.90, E-value 2e-19" complement(4570. .5277)
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           /note="NMA0007, unknown, len: 235
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Length:
Matches:
                                                                                                                                                                                                                                                                                                                                                                                    complement(3564. .3863)
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         complement(3863. .4534)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                complement(4034. .4525)
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253.50
36.50%
22.04%
7.99%
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84846

160

144 spileLeuSerAspGlyAsnLeuAlaGluTyrTyrArgAsnAlaLeuGlu-----

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84933

176 luAsnSerLysThrSerValLeuGlyAlaValThrArgLys------GlyTyrP 192

84847 CCATGAAGCCCGGCAAATGGTACGAA-----C

GCCAGCAGATGACCGCCGTTTTGGGTGAGATTCAGAACCGCATGGGCTCGGCAGGCTACG

84874

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------AsnTrpGlnGlnProValGlySerAspPheAspGlnAspSerTrpG 176

161

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84798

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84991 TCGTCCTGCACATCGAACCGGGCCGGAAAATCTACGTCAACGAAATCCACATCACCGGCA 85050

hrGlnArgTyrProGluGlnIleValSerGlyLeuAlaArgPheGlnProGlyThrProT

232

ò

euAsnValValValAspSerGlyArgProlleAlaPheGlyAspPheGluIleThrGlyT

212

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84934 CATACAGCGAAATC---AGCGTACAGCCGCTGCCAAACGCCGAAACCAAAACGGTCGATT 84990

192 roLeuAlaLysLeuGlyAsnThrArgAlaAlaValAsnProAspThrAlaThrValAspL 212

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85459 CCTTCGACCCGCGCAAAGCATCGACCAGCATCAAACAATATAAAACCACCACGCAGGCG 85518
                                                                                                                                                                                                                                                                                                            85285 ATACCGGCCTGGTCATGTCCGCAGGCGTTTCCCAAGACAACCTGTTCGGTACGGGC---- 85340
             85110
                                                                                      85169
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                                                  272
                                                                                                                         290
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                                                                                                                                                                                                290 ysValSerValThrGluValLysArgHisLysLeuGluThrGlyIleArgLeuAspSerG 310
                                                                                                                                                                                                                                                                     310 luTyrGlyLeuGlyGlyLysIleAlaTyrAspTyrTyrAsnLeuPheAsnLysGlyTyrI 330
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               yrTrp-----ThrSerAsnValSerTyrAsnArgSerThrThrGlnAsnL 373
yrAspLeuAspLeuLeuLeuAspPheGlnGlnAlaLeuGluGlnAsnGlyH1sTyrSerG
                                                                                                                         272 lyAlaSerValGlnAlaAspPheAspArgLeuGlnGly-----AspArgValProValL
                                                                                                                                                                                                                     85111 ACGACACCTCCAAGCTGCAACGCTCCAAAGAGCGCGTCGAGCTTTTGGGCTACTTCGAC-
                                                                                                                                                             ----AACGTACAGTTTGATGCCGTCCCGCTTGCCGGCACACCCGACAAGTCGATTTGA
                                                                                                                                                                                                                                                                                                                                               leGlySerValValTrpAspMetAspLysTyrGluThrThrLeu--------
                                                                                                                                                                                                                                                                                                                                                                                   --AAGTCGGCCGCCTGCGCGCCTCACGAAGCAAACCACGCTCAACGGCTCGCTGTCGT
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Db 84451 TCGCCCCCAACCGCGTCGACATCGACATTGACGAGGCCAAATCCGCCAAAATCA 84510 ------ProLysPhe 53 SerProAspThrGluSerValLysLeuLys----41

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US-09-857-669-2 (1-609) x NMA1Z2491 (1-340806)

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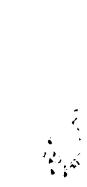
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Percent Similarity: Best Local Similarity: Query Match:

Score:

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Ω	85519		82
ò	393	laArgLeuGlyAlaGluPheLeuA 401	
qq	85579		88
δ	401	laGluGlyArgLysIleProGlySerAspIleAspLeuGlyAsnSerHisAlaThrMetL 421	
qq	85639	SERVICE AND AND ASSESSED AND ASSESSED A	39
Qy	421	euThralaSerTrpLysArgGlnLeuLeuAsnAsnValLeuHisProGluAsnG 439	
qq	85690		61
οy	439	lyHisTyrLeuAspGlyLysIleGlyThrThrLeuGlyThrPheLeuSerSerThrAlaL 459	
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οy	459		
Ωp	85777	TCGCCCTGCCCGGCAGCAAACTGCAATACTACTCCGCCACACCACAAACCTGGTTCT 85836	96
δ	476		
Op	85837	TCCCCTTAAGCAAAACCTTCAGGCGTATGCTCGGGGGGAAGTCGGGATTGCGGGCGT 85896	96
οy	492		
Op	85897	ACGGCAGAACCAAAGAAATCCCCTTCTTTGAAAACTTCTACGGCGGCGGCGGCTGGGTTCGG 859	56
ò	511	alArgGlyTyrGluLeuAspSerIleGly520	
QQ	85957	TGCGCGGATACGAAAGCGGCACGCTCCGAAAGTGTATGACGAAATACGGCGAAAAAA 86016	91
ò	521	LeuAlaGlyProAsnGlySerValLeuProGluArgAlaLeuLeuValGlySerLeuG 540	
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οy	540		
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ογ	557	etGlyAsp 559	
og O	86122	111 CAGGCAGCGTGGGACGGCAAAACCTACGACGACAACAGCAGTTCCGCGACCGGCGCGA 86181	31
ογ	260		
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ò	570	ysHisGlySerGlyLeuGlyValArgTrpPheSerProLeuAlaProPheSerPheAspI 590	
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Search completed: November 9, 2002, 02:46:21 Job time : 4583 secs



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GenCore version 5.1.3
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609 AA

AAY99623 standard; Protein;

RESULT 1

using sw model protein search, OM protein 2002, 01:03:13 ; Search time 36 Seconds δ November Run on:

(without alignments) 2254.156 Million cell updates/sec

US-09-857-669-2

1 MMIKPTALLLPALFFFPHAY.....IAYGHSDKKIRWHISLGTRF Title: Perfect score: Sequence:

Scoring table:

908470 segs, 133250620 residues

OLIGO Gapop 60.0 , Gapext 60.0

Searched:

15 •• Word size Total number of hits satisfying chosen parameters:

9

length: 0 length: 2000000000 sed Minimum DB Maximum DB

Post-processing: Listing first 1000 summaries

Database

/SIDS2/gcgdata/geneseq/geneseqp-emb1/AA1980.DAT; /SIDS2/gcgdata/geneseq/geneseqp-emb1/AA1981.DAT; /SIDS2/gcgdata/geneseq/geneseqp-emb1/AA1982.DAT; A_Geneseq_101002:*

/SIDS2/gcgdata/geneseq/genesegp-emb1/AA2002.DAT:* /SIDS2/gcgdata/geneseq/geneseqp-embl/AA2000. /SIDS2/gcgdata/geneseq/geneseqp-embl/AA2001.

chance to have a result being printed, score greater than or equal to the score of the result beland is derived by analysis of the total score distribution results predicted by the number of 13 ę

		Description		Neisseria meningit	Neisseria gonorrhe				
		di		AAY99623	AAY99624	AAY74862	AAY99625	AAY74861	AAY74860
		DB		21	21	21	21	21	21
		Match Length DB 1		609	609	615	587	615	522
æ	Query	Match	1 1 1 1 1 1 1	100.0	100.0	40.9	32.5	32.5	27.9
		Score		609	609	249	198	198	170
	Result	No.		-	7	e	4	'n	9

ALIGNMENTS

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                                                                                             BASB040; bacterial disease; respiratory tract infection; bacteraemia; meningitis; cancer; autoimmune disease.
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                                                                  Neisseria meningitidis BASB040 putative protein sequence #1.
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Pred. No. 0;
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609; Conservative
                                                                                                                                    Neisseria meningitidis
                                                                                                                                                                                                                                                                                                                             WPI; 2000-423426/36.
N-PSDB; AAA48507.
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                               LETGIRLDSEYGLGGKIAYDYYNLFNKGYIGSVVWDMDKYETTLAAGISQPRNYRGNYWT 360
                                                                LTASWKRQLLNNVLHPENGHYLDGKIGTTLGTFLSSTALIRTSARAGYFFTPENKKLGTF 480
                                                                                                           IIRGQAGYTVARDNADVPSGLMFRSGGASSVRGYELDSIGLAGPNGSVLPERALLVGSLE 540
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                                                                                                                      541 YQLPFTRTLSGAVFHDMGDAAANFKRMKLKHGSGLGVRWFSPLAPFSFDIAYGHSDKKIR
                      SNVSYNRSTTONLEKRAFSGGIWYVRDRAGIDARLGAEFLAEGRKIPGSDIDLGNSHATM
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100.0%; Pred. No. 0;
ive 0; Mismatches
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es 609; Conserv
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Neisseria meningitidis; Neisseria gonorrheae; antigen; vaccine; antigenic; diagnosis; immunogenic; infection; meningitis; septicaemia; antibacterial; gene therapy.
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                                                            AYTVHITPGPRTKIANVGVAILGDILSDGNLAEYYRNALENWQQPVGSDFDQDSWENSKT 180
                                                                                                                                               SVLCAVTRKGYPLAKLGNTRAAVNPDTATVDLNVVVDSGRPIAFGDFEITGTQRYPEQIV 240
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98US-0094869.
98US-0098994.
98US-0103749.
98US-0103794.
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09-OCT-1998;
09-OCT-1998;
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587 AA.

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AAY99625 standard; Protein;
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                                                                                                                                                                                     AA253015 to AA254536, AA254577 to AA254615, and AAY74253 to AAY75941 represent novel Neisseria meningitis and N. gonorrheae polynucleotides and polypeptides. AA52457 to AA254576 and AA254616 to AA255473 represent PCR primers used in the exemplification of the present invention. The polypeptides, the polynucleotides, antibodies and compositions of the invention can be used as vaccines, as diagnostic reagents, and as immunogenic compositions. The polypeptides can be used in the manufacture of medicaments for treating or preventing infection due to Neisserial bacteria (e.g. meningitis and septicaemia), to detect the presence of Neisseria bacteria, or to raise antibodies. They may also be used to screen for agonists or antagonists, which may themselves have use as antibacterial agents. The polynucleotides of the invention may also be used in gene therapy protocols.
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Scalato E, Scarselli
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                                                                                                                                     Novel Neisserial polypeptides predicted to be useful antigens
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Pred. No. 4.7e-244;
0; Mismatches 2;
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Ratti G,
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Rappuoli R,
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 98US-0103796
99US-0121528
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Matches 449; Conservative
                                         (GENO-) INST GENOMIC RES
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Tettelin H, Venter JC;
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                              (CHIR ) CHIRON CORP
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25-FEB-1999;
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Janop ..

RESULT 4

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The present sequence is a putative version of the Neisseria meningitidis strain H44/76 BASB040 protein sequence. This protein is similar to the D15 outer membrane protein of the bacterium. The protein, its gene, antibodies, antagonists and agonists can be used to diagnose and treat bacterial diseases such as those leading to upper respiratory tract infections, bacteraemia and meningitis. In addition, they can be used in vaccines for use against cancer and autoimmune diseases.
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                                                                                                      BASB040; bacterial disease; respiratory tract infection; bacteraemia; meningitis; cancer; autoimmune disease.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           412 DLGNSHATMLTASWKRQLLNNVLHPENGHYLDGKIGTTLGTFLSSTALIRTSARAGYFFT 471
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Novel BASB040 polypeptides of Neisseria meningitidis useful for diagnostic, prophylactic and therapeutic purposes against microbial diseases comprise a specific amino acid sequence
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Length 587;
                                                   Weisseria meningitidis BASB040 putative protein sequence.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    32.5%; Score 198; DB 21; I llarity 100.0%; Pred. No. 3.3e-192; Conservative 0; Mismatches 0;
                                                                                                                                                                                                                                                                                                                                                                                                                                                   SMIK ) SMITHKLINE BEECHAM BIOLOGICALS.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Claim 4; Page 62; 98pp; English.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               AAY74861 standard; Protein;
                                                                                                                                                                                                                                                                                                                                                                                             98GB-0026886
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      (first entry)
  (first entry)
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Neisseria meningitidis.
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Local Similarity
hes 198; Conserva
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      587 AA;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  N-PSDB; AAA48509
                                                                                                                                                                                                                                   VO200034480-A1
                                                                                                                                                                                                                                                                                                                                                                                             J7-DEC-1998;
03-JAN-2001
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   21-MAR-2000
                                                                                                                                                                                                                                                                                         15-JUN-2000
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Ruelle J;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Sequence
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Query Match
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AAY74861
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                AAE53015 to AAE54536, AAES4577 to AAE54615, and AAY74253 to AAY75941 represent novel Neisseria meningitis and N. gonorrheae polynucleotides and polypeptides. AAE54571 to AAE5456 and AAE54616 to AAE55473 represent PCR primers used in the exemplification of the present invention. The polypeptides, the polynucleotides, antibodies and compositions of immunogenic compositions. The polypeptides can be used as vaccines, as diagnostic reagents, and as immunogenic compositions. The polypeptides can be used in the manufacture of medicaments for treating or preventing infection due to beisserial bacteria (e.g. meningitis and septicaemia), to detect the presence of Neisseria bacteria, or to raise antibodies. They may also be used to screen for agonists or antagonists, which may themselves have use as antibodiacterial agents. The polynucleotides of the invention
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 ö
                              Neisseria meningitidis; Neisseria gonorrheae; antigen; vaccine;
antigenic; diagnosis; immunogenic; infection; meningitis; septicaemia;
antibacterial; gene therapy.
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Scalato E, Scarselli M;
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        PENKKLGTFIIRGQAGYTVARDNADVPSGLMFRSGGASSVRGYELDSIGLAGPNGSVLPE 531
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   RALLVGSLEYQLPFTRTLSGAVFHDMGDAAANFKRMKLKHGSGLGVRWFSPLAPFSFDIA 591
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Novel Neisserial polypeptides predicted to be useful antigens for vaccines and diagnostics \cdot
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 .;
0
Neisseria meningitidis ORF 286 protein sequence SEQ ID NO:1196
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100.0%; Pred. No. 3.4e-192;
ive 0; Mismatches 0;
                                                                                                                                                                                                                                                                                                                                                                                                    Hickey E,
Ratti G,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      may also be used in gene therapy protocols.
                                                                                                                                                                                                                                                                                                                                                                                                    Grandi G,
Rappuoli R,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Claim 2; Page 667; 1453pp; English.
                                                                                                                                                                                                                             98US-0094869.
98US-0098694.
98US-0103749.
98US-0103794.
98US-0103794.
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                                                                                                                                                                                                                                                                                                                                                    (CHIR ) CHIRON CORP. (GENO-) INST GENOMIC RES.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Matches 198; Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                 Pizza M, I
Venter JC;
                                                                                                                                                                                                                                                                                                                                                                                                    Galeottí C,
                                                                                          Neisseria meningitidis
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                                                                                                                       W09957280-A2
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Tettelin H,
                                                                                                                                                                                                                                                                           09-OCT-1998;
09-OCT-1998;
                                                                                                                                                                                                                                                                                                                        25-FEB-1999;
                                                                                                                                                  11-NOV-1999
                                                                                                                                                                                                                                31-JUL-1998;
02-SEP-1998;
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Best Local
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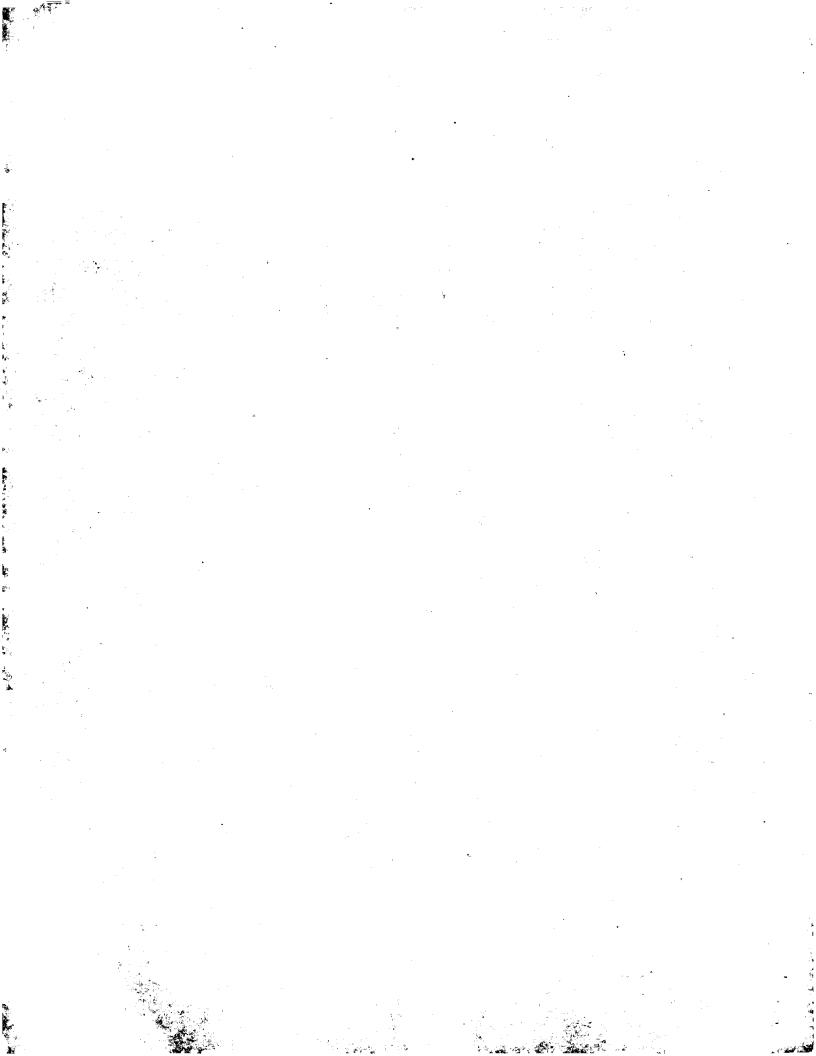
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Masignani V, Mora M;
Scalato E, Scarselli M;
                                                                                                                                                                                                                                                          Neisseria meningitidis; Neisseria gonorrheae; antigen; vaccine; antigenic; diagnosis; immunogenic; infection; meningitis; septicpemia; antibacterial; gene therapy.
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          40 KSPDTESVKLKPKFPVRIDTQDSEIKDMVEEHLPLITQQQEEVLDKEQTGFLAEEAPDNV 99
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Novel Neisserial polypeptides predicted to be useful antigens for vaccines and diagnostics
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                                                                                                                                                                                                            Neisseria gonorrheae ORF 286 protein sequence SEQ ID NO:1194.
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Grandi G, 1
Rappuoli R,
                                                 AAY74860 standard; Protein; 522 AA.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           98US-0083758.
98US-0094869.
98US-009994.
98US-0103749.
98US-0103794.
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                                                                                                                                                     21-MAR-2000 (first entry)
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Petersen J, Pizza M,
Tettelin H, Venter JC;
                                                                                                                                                                                                                                                                                                                                                                     Neisserla gonorrheae.
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Matches 170; Conserv
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02-SEP-1998;
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09-OCT-1998;
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31-JUL-1998;
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                                                                                                    AAY74860;
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RESULT 6
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Search completed: November 9, 2002, 01:11:27 Job time : 36 secs g



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GenCore version 5.1.3
Copyright (c) 1993 - 2002 Compugen Ltd.
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OM protein - protein search, using sw model

Run on:

November 9, 2002, 01:10:43; Search time 20 Seconds (without alignments) 895.928 Million cell updates/sec

US-09-857-669-2 609 1 MMIKPTALLLPALFFFPHAY.....IAYGHSDKKIRWHISLGTRF 609 Title: Perfect score: Sequence:

Scoring table:

OLIGO Gapop 60.0 , Gapext 60.0

262574 segs, 29422922 residues Searched:

15 Word size :

0 Total number of hits satisfying chosen parameters:

Minimum DB seq length: 0 Maximum DB seq length: 2000000000

Post-processing: Listing first 1000 summaries

Database :

Issued_patents_AA:*
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6: /cgn2_6/ptodata/1/laa/PCTUS_COMB.pep:*

Pred. No. is the number of results predicted by chance to have a score greater than or equal to the score of the result being printed, and is derived by analysis of the total score distribution.

SUMMARIES

Description G Query Score Match Length DB Result Š

No matches found

Search completed: November 9, 2002, 01:14:22 Job time : 20 secs

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us-09-857-669-2.oligo.rapb

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GenCore version 5.1.3
Copyright (c) 1993 - 2002 Compugen Ltd.
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November 9, 2002, 01:13:03; Search time 14 Seconds Run on:

OM protein - protein search, using sw model

(without alignments)
627.205 Million cell updates/sec

609 1 MMIKPTALLLPALFFFPHAY.....IAYGHSDKKIRWHISLGTRF 609 US-09-857-669-2

Title: Perfect score: Sequence:

OLIGO Gapop 60.0 , Gapext 60.0 Scoring table:

92612 segs, 14418503 residues Searched:

15

Word size :

0 Total number of hits satisfying chosen parameters:

Minimum DB seq length: 0 Maximum DB seq length: 2000000000

Post-processing: Listing first 1000 summaries

Published_Applications_AA:* Database :

1: /cgn2_6/ptodata/1/pubpaa/USOB_NEW_PUB.pep:*
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3: /cgn2_6/ptodata/1/pubpaa/PCT_NEW_PUB.pep:*
3: /cgn2_6/ptodata/1/pubpaa/USOG_NEW_PUB.pep:*
5: /cgn2_6/ptodata/1/pubpaa/USO7_NEW_PUB.pep:*
6: /cgn2_6/ptodata/1/pubpaa/USO7_PUBCOMB.pep:*
7: /cgn2_6/ptodata/1/pubpaa/USO7_PUBCOMB.pep:*
8: /cgn2_6/ptodata/1/pubpaa/USO8_PUBCOMB.pep:*
9: /cgn2_6/ptodata/1/pubpaa/USO8_PUBCOMB.pep:*
10: /cgn2_6/ptodata/1/pubpaa/USO8_NEW_PUB.pep:* /cgn2_6/ptodata/l/pubpaa/US10_NEW_PUB.pep:*/cgn2_6/ptodata/l/pubpaa/US10_PUBCOMB.pep:*/cgn2_6/ptodata/l/pubpaa/US60_NEW_PUB.pep:*/cgn2_6/ptodata/l/pubpaa/US60_PUBCOMB.pep:*/ Pred. No. is the number of results predicted by chance to have a score greater than or equal to the score of the result being printed, and is derived by analysis of the total score distribution.

Description Query Score Match Length DB Result Š.

No matches found

Search completed: November 9, 2002, 01:17:39 Job time : 14 secs

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C; Species: Neisseria meningitidis
C; Species: Neisseria meningitidis
C; Date: 31-Mar-2000 #sequence_revision 31-Mar-2000 #text_change 19-Jan-2001
C; Accession: G81003
R; Tettclin, H.; Saunders, N.J.; Heidelberg, J.; Jeffries, A.C.; Nelson, K.E.; Eisen, Hickey, E.K.; Haft, D.H.; Salzberg, S.L.; White, O.; Fleischmann, R.D.; Dougherty, B. Hickey, E.K.; Haft, D.H.; Salzberg, S.L.; White, O.; Fleischmann, R.D.; Dougherty, B. Science 287, 1809-1815, 2000
A; Authors: Grandi, G.; Sun, L.; Smith, H.O.; Fraser, C.M.; Moxon, E.R.; Rappuoli, R. A; Reference number: A81000; MUID: 20175755; PMID: 10710337
A; Accession: G81003
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          A;Cross-references: GB:AE002561; GB:AE002098; NID:g7227384; PIDN:AAF42442.1; PID:g72
A;Experimental source: serogroup B, strain MC58
C;Genetics:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             conserved hypothetical protein NMB2134 [imported] - Neisseria meningitidis (strain )
                                                                                                                                                                                                                                                      180
                                                                                                                                                                                                                                                                                                                                                                                                      246
                                                                                                                                                  SGLARFQPGTPYDLDLLLDFQQALEQNGHYSGASVQADFDRLQGDRVPVKVSVTEVKRHK 300
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  LETGIRLDSEYGLGGKIAYDYYNLFNKGYIGSVVWDMDKYETTLAAGISQPRNYRGNYWT 360
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            SNVSYNRSTTQNLEKRAFSGGIWYVRDRAGIDARLGAEFLAEGRKIPGSDIDLGNSHATM 420
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  Gaps
                                                                            MMIKPTALLLPALFFFPHAYAPAADLSENKAAGFALFKNKSPDTESVKLKPKFPVRIDTQ
                                                                                                                                                                                                                                                   121 AYTVHITPGPRTKIANVGVAILGDILSDGNLAEYYRNALENWQQPVGSDFDQDSWENSKT
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Best Local Similarity 100.0%; Pred. No. 5.1e-196;
Matches 198; Conservative 0; Mismatches 0;
  5:
  Mismatches
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449; Conservative
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A;Molecule type: DNA
A;Residues: 1-635 <TET>
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probable outer membrane protein NMA0296 [imported] - Neisseria meningitidis (strain 2249
c;Species: Neisseria meningitidis
C;Date: 05-May-2000 #sequence_revision 05-May-2000 #text_change 02-Feb-2001
C;Accession: A82025
R;Parkhill, J; Achtman, M; James, K.D.; Bentley, S.D.; Churcher, C.; Klee, S.R.; Morel
H, Holroyd, S.; Jagels, K.; Leather, S.; Moule, S.; Mungall, K.; Quail, M.A.; Rajandream,
A;Title: Complete DNA sequence of a serogroup A strain of Neisseria menigitidis 22491.
A;Accession: A82025
A;Accession: A82
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A; Cross-references: GB:AL162752; GB:AL157959; NID:g7378778; PIDN:CABB3602.1; PID:g737905
A; Experimental source: serogroup A, strain 22491
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2787.898 Million cell updates/sec
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                                                                                                                                                                       2002, 01:10:03 ; Search time 21 Seconds
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                       5.1.3
Compugen Ltd.
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Pred. No. 8.3e-249;
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                       GenCore version
Copyright (c) 1993 - 2002
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Gapop 60.0 , Gapext 60.0
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GB1003
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99.6%;
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Maximum DB seq length: 200000000
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Match Length DB
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635
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Best Local Similarity
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Gene: NMA0296
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198
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OM protein - protein search, using sw model

November 9, 2002, 01:03:58; Search time 17 Seconds (without alignments) 1485.828 Million cell updates/sec Run on:

US-09-857-669-2 609 1 MMIKPTALLLPALFFFPHAY.....IAYGHSDKKIRWHISLGTRF 609

Title: Perfect score: Sequence:

OLIGO Gapop 60.0 , Gapext 60.0 Scoring table:

112892 seqs, 41476328 residues Searched:

Total number of hits satisfying chosen parameters: 15 Word size :

0

Minimum DB seq length: 0 Maximum DB seq length: 2000000000

Post-processing: Listing first 1000 summaries

SwissProt_40:* Database : Pred. No. is the number of results predicted by chance to have a score greater than or equal to the score of the result being printed, and is derived by analysis of the total score distribution.

SUMMARIES

Description esult Query No. Score Match Length DB Result

No matches found

Search completed: November 9, 2002, 01:12:05 Job time : 17 secs

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Scoring table:

Minimum DB Maximum DB

Word size

Searched:

Database :

Perfect score:

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OM protein

Run on:

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SEQUENCE FROM N.A.
SERGATOR A.A.
STRAIN-22491, SERGATOR A / SERGATOR AA;
MEDLINE-2022556; PubMed-10761919;
Parkhill J., Achtman M., James K.D., Bentley S.D., Churcher C.,
Rales S.R., Morelli G., Basham D., Brown D., Chillingworth T.,
Bavies R.M., Davis P., Devlin K., Feltwell T., Hamlin N., Holroyd S.,
Jagels K., Leather S., Moule S., Mongall K., Quail M.A.,
Rajandream M.A., Rutherford K.M., Simmonds M., Skelton J.,
Whitehead S., Spratt B.G., Barrell B.G.;
"Complete DNA sequence of a serogroup A strain of Neisseria
                                                                                                                                                                                                                                                                                                                                                                                                                                               SGLARFQPGTPYDLDLLLDFQQALEQNGHYSGASVQADFDRLQGDRVPVKVSVTEVKRHK 300
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Bacteria; Proteobacteria; beta subdivision; Neisseriaceae; Neisseria.
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....... meningitidis (serogroup A).
Bacteria; Proteobacteria; beta subdivision; Neisseriaceae; Neisseria.
NCBL_TaxID=65699;
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                                                                                                                                                                                                                                 Naturé 404:502-506(2000).
EMBL, AL162752: CAB83602.1; -.
COMPLETE protecome.
SEQUENCE 615 AA; 67775 MW; B9A64607638E1CCB CRC64;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             01-OCT-2000 (TrEMBLrel. 15, Created)
01-OCT-2000 (TrEMBLrel. 15, Last sequence update)
01-MAR-2002 (TrEMBLrel. 20, Last annotation update)
                                                                                                                                                                                                                                                                                                          40.9%; Score 249; DB 16;
99.6%; Pred. No. 2.6e-249;
iive 0; Mismatches 2;
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SEQUENCE FROM N.A.
STRAIN-MC58 / SEROGROUP B;
MEDLINE-20175755; Pubmed-10710307;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Hypothetical protein NMB2134
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Best Local Similarity 99.6
Matches 449; Conservative
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09jxb7 neisseria m
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3802.506 Million cell updates/sec
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                                                                                                            9, 2002, 01:09:24 ; Search time 33 Seconds
                       5.1.3
Compugen Ltd.
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01-0CT-2000 (TrEMBLrel. 15, Last sequence update)
01-DEC-2001 (TrEMBLrel. 19, Last annotation update)
                                                                                                                                                                                                                                                                                                                                     Total number of hits satisfying chosen parameters:
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                       GenCore version
Copyright (c) 1993 - 2002
                                                                                  protein search, using sw model
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09JXB7
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sp_unclassified:*
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Science 287:1809-1815(2000).
TIGR: NMB2134;
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GenCore version 5.1.3
Copyright (c) 1993 - 2002 Compugen Ltd.
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BASB040; bacterial disease; respiratory tract infection; bacteraemia; meningitis; cancer; autoimmune disease; ds. Neisseria meningitidis BASB040 putative coding sequence #1. AAA48507 standard; DNA; 1830 BP meningitidis. 03-JAN-2001 Neisseria AAA48507; RESULT 1 AAA48507 ID AAA4

Location/Qualifiers

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                                                                                                                                 CTGATGTTCCGCAGCGGCGCGCGTCTTCCGTGCGCGCTTACGAACTCGACAGCATCGGA 1560
                                                                                                                                                                                                                                                                                tract infection; bacteraemia; ds.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Novel BASB040 polypeptides of Neisseria meningitidis useful for diagnostic, prophylactic and therapeutic purposes against microbial diseases comprise a specific amino acid sequence
                                                  AlaAlaAsnPheLysArgMetLysLeuLysHisGlySerGlyLeuGlyValArgTrpPhe
                                                                                                                        SerProLeuAlaProPheSerPheAspIleAlaTyrGlyHisSerAspLysLysIleArg
                                                                                                                                                                                                                                                                    Neisseria meningitidis BASB040 putative coding sequence #2.
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                                                                                                                                                                                                                                                                                    BASB040; bacterial disease; respiratory meningitis; cancer; autoimmune disease;
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                                                                                                                                                       CTCGAAACCGGCATCCGCCTCGAATTCGGAATACGCTTTGGGCGGCGAAAATCGCCTACGAC
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AAE53015 to AAE54536, AAE54577 to AAE54615, and AAY74253 to AAY75941 represent novel Neisseria meningitis and N. gonorrheae polynucleotides and polypeptides. AAE54571 to AAE54576 and AAE54616 to AAE54473 represent PCR primers used in the exemplification of the present invention. The polypeptides, the polynucleotides, antibodies and compositions of immunogenic compositions. The polypeptides can be used in the manufacture of medicaments for treating or preventing infection due to Neisserial bacteria (e.g. meningitis and septicaemia), to detect the presence of Neisseria bacteria, or to raise antibodies. They may also be used to screen for agonists or antagonists, which may themselves have use as antibacterial agents. The polynucleotides of the invention
                                                                                                                                                                                                                                                                                                                                                                                                                               Ξ
antigenic; diagnosis; immunogenic; infection; meningitis; septicaemia;
antibacterial; gene therapy; ds.
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Scalato E, Scarselli
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Pizza M, Rappuoli
Venter JC;
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                                                                                                                                                                                                                                                                                                                                                           CHIRON CORP.
INST GENOMIC RES
                                                   Neisseria meningitidis
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P-PSDB; AAY74862.
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Best Local Similarity:
                                                                                                                                                                                            01-MAY-1998;
31-JUL-1998;
02-SEP-1998;
02-SEP-1998;
09-OCT-1998;
09-OCT-1998;
25-FEB-1999;
                                                                                    W09957280-A2
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Tettelin H,
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                                                                                                                       11-NOV-1999
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GENOMIC CHIRON 31-JUL-1998; 02-SEP-1998; 02-SEP-1998; 09-OCT-1998; 09-OCT-1998; 25-FEB-1999; (CHIR) CHIRC (GENO-) INST WO9957280-A2 30-APR-1999; 21-MAR-2000 01-MAY-1998 11-NOV-1999 Neisseria AAZ53623; 1279 1339 1399 1459 501 1579 541 1699 581 1759 601 1819 441 461 521 RESULT q 9 g 8 oy Dp Op q q ò ò ò ò ò 8 ò ò ç 240 400 LeuThrAlaSerTrpLysArgGlnLeuLeuAsnAsnValLeuHisProGluAsnGlyHis 440 318 200 678 738 260 GluValLeuAspLysGluGlnThrGlyPheLeuAlaGluGluAlaProAspAsnValLys GAAGTATTGGACAAGGAACAGACGGCTTCCTCGCCGAAGAAGCACCGGACAACGTTAAA SerGlyLeuAlaArgPheGlnProGlyThrProTyrAspLeuAspLeuLeuLeuAspPhe AspSerGluIleLysAspMetValGluGluHisLeuProLeuIleThrGlnGlnGlnGlu ProlleAlaPheGlyAspPheGluIleThrGlyThrGlnArgTyrProGluGlnIleVal GlnGlnAlaLeuGluGlnAsnGlyHisTyrSerGlyAlaSerValGlnAlaAspPheAsp GlylleTrpTyrValArgAspArgAlaGlylleAspAlaArgLeuGlyAlaGluPheLeu AlaAlaValAsnProAspThrAlaThrValAspLeuAsnValValValAspSerGlyArg 421 619 1039 1099 1159 1219 83 259 101 319 379 141 439 499 559 201 619 221 241 739 199 281 859 301 919 321 979 361 381 401 61 121 161 181 261 341 ි <u>අ</u>

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; diagnosis; immunogenic; infection; meningitis; septicaemia;
rial; gene therapy; ds.
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                                                                                                                                                                                                              561 AlaAlaAsnPheLysArgWetLysLeuLysHisGlySerGlyLeuGlyValArgTrpPhe
                                      LeuAlaGlyProAsnGlySerValLeuProGluArgAlaLeuLeuValGlySerLeuGlu
                                                                                                                                                                                                                                                                                                      TyrGlnLeuProPheThrArgThrLeuSerGlyAlaValPheHisAspMetGlyAspAla
                                                                                          ArgThrSerAlaArgAlaGlyTyrPhePheThrProGluAsnLysLysLeuGlyThrPhe
                                                                                                                                           481 IleIleArgGlyGlnAlaGlyTyrThrValAlaArgAspAsnAlaAspValProSerGly
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antigenic; diagnosis; immunog
antibacterial; gene therapy;
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98US-0094869.
98US-0098094.
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98US-0103794.
98US-0103796.
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Ξ Scarselli Mora Masignani V, Scalato E, S ස් ර ප Hickey Ratti Galeotti C, Grandi G, Pizza M, Rappuoli R, Venter JC; Fraser C, Ga Petersen J, Tettelin H,

2000-062150/05

P-PSDB; AAY74861

be useful antigens ţ predicted Novel Neisserial polypeptides vaccines and diagnostics

Page 667; 1453pp; English. claim 7;

AA253015 to AA254536, AA254577 to AA254615, and AAY74253 to AAY75941 represent novel Neisseria meningitis and N. gonorrheae polynucleotides and polypeptides. AA554576 and AA554616 to AA55473 represent PCR primers used in the exemplification of the present invention. The polypeptides, the polynucleotides, antibodies and compositions of immunogenic compositions. The polypeptides can be used as vaccines, as diagnostic reagents, and as immunogenic compositions. The polypeptides can be used in the manufacture of medicaments for treating or preventing infection due to Neisserial bacteria (e.g. meningitis and septicaemia), to detect the presence of Neisseria bacteria, or to ralse antibodies. They may also be used to screen for agonists or antagonists, which may themselves have use as antibacterial agents. The polynucleotides of the invention may also be used in gene therapy protocols.

0 other; Ë C; 467 G; 329 BP; 439 A; 613 Sequence 1848

Length:
Matches:
Conservative:
Mismatches:
Indels:
Gaps: 5.42e-282 3136.00 99.18% 98.69% 98.83% Best Local Similarity: Query Match: DB: Percent Similarity: Alignment Scores: ٠. و Score:

1848 601 3 5 0

(1-1848)(1-609) x AAZ53623 US-09-857-669-2

138 198 GluValLeuAspLysGluGlnThrGlyPheLeuAlaGluGluAlaProAspAsnValLys 100 20 78 40 9 80 GAAGTATTGGACAAGGAACAGGGCTTCCTCGCCGAAGAAGGCCCGGACAACGTAAA SerProAspThrGluSerValLysLeuLysProLysPheProValArgIleAspThrGln MetMetIleLysProThrAlaLeuLeuLeuProAlaLeuPhePheProHisAlaTyr AlaProAlaAlaAspLeuSerGluAsnLysAlaAlaGlyPheAlaLeuPheLysAsnLys 6 21 4 41 139 61 661 259 81 ò g ò g ò qq à a q ò

120 378 140 438 IleLeuGlyAspIleLeuSerAspGlyAsnLeuAlaGluTyrTyrArgAsnAlaLeuGlu 160 ThrMetLeuArgSerLysGlyTyrPheSerSerLysValSerLeuThrGluLysAspGly AlaTyrThrValHisIleThrProGlyProArgThrLysIleAlaAsnValGlyValAla 101 319 121 141 g qq ò ò ò

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1098 300 360 CTGATGTTCCGCAGCGGCGGCGCGTCTTCCGTGCGCGGGTTACGAACTCGACAGCATCGGA SerasnvalSerTyrasnargSerThrThrGlnAsnLeuGluLysArgAlaPheSerGly CTGACCGCCTCTTGGAAACGCCAGCTGCTCAACAACGTGCTGCATCCCGAAAACGCCCAT LeuMetPheArgSerGlyGlyAlaSerSerValArgGlyTyrGluLeuAspSerIleGly SerValLeuGlyAlaValThrArgLysGlyTyrProLeuAlaLysLeuGlyAsnThrArg ArgLeuGlnGlyAspArgValProValLysValSerValThrGluValLysArgHisLys LeuGluThrGlyIleArgLeuAspSerGluTyrGlyLeuGlyGlyLysIleAlaTyrAsp TyrTyrAsnLeuPheAsnLysGlyTyrIleGlySerValValTrpAspMetAspLysTyr GluThrThrLeuAlaAlaGlyIleSerGlnProArgAsnTyrArgGlyAsnTyrTrpThr AGCAACGTTTCCTACAACCGTTCGACCACCCAAAAACCTCGAAAAAACGCGCCTTCTCCGGC AlaGluGlyArgLysIleProGlySerAspIleAspLeuGlyAsnSerHisAlaThrMet LeuThrAlaSerTrpLysArgGlnLeuLeuAsnAsnValLeuHisProGluAsnGlyHis AlaAlaValAsnProAspThrAlaThrValAspLeuAsnValValAspSerGlyArg 341 1039 1099 1159 1219 1399 1459 559 619 221 739 199 281 859 301 321 979 361 381 401 421 441 461 481 181 201 261 501 521 q qq g q g qq qq g g g q g ð Ω qq ò g ò ò g à ά ò ŏ ò ò ò ò ç ò a ò ô à

Meningococcus B vaccines have failed mainly due to antigen tolerance. Multivalent vaccines have also been tried but none have successfully overcome antigenic variability. The provision of further, complete sequences may provide an opportunity to identify secreted or surface exposed proteins that may be presumed targets for the immune system a which are not antigenically variable or at least more conserved than

G; 22730 T; 2 other;

BP; 24051 A; 24249 C; 21902

Sequence 92934

Alignment Scores: :. 9

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other more variable regions.

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Length:

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The present invention describes methods of obtaining immunogenic proteins from Neisseria genomic sequences. AAA81453 to AAA82414
represent specifically claimed Neisseria meningitidis genomic DNA sequences; AAA81260 to AAA8263 represent Neisseria DNA sequences and their corresponding proteins; AAA81254 to AAA81259 and AAA81301 represent PCR primers used in the isolation of Neisseria meningitidis DNA sequences; and AAA8132 to AA81452 represent Neisseria meningitidis DNA sequences; and AAA8132 to AA81452 represent Neisseria meningitidis DNA sequences; and AAA8132 to AAA81452 represent Neisseria meningitidis DNA sequences; and AAA8132 to AAA81452 represent Neisseria meningitidis DNA sequences, and antibodies sequences, which are all used in the manufacture of a composition can be used as a medicament (or in the manufacture of a medicament) for treating, preventing or diagnosing infection due to Neisserial bacteria. For example, some of the identified proteins could be components of vaccines against Meningococcus B; against all serotypes; and/or against all pathogenic Neisseriae. Identification of sequences from the bacterium will also featiliate production of blological probes, particularly organism-specific probes. Attempts to make efficacious
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                                                                                                                                                                                                                            Nelsserla meningitidis; Nelsseria gonorrheae; genome; immunogenic; antigen; vaccine; diagnosis; infection; antibacterial; identification; Meningococcus B; MenB; ds.
                              Scarlato
                                                                                                                                              TyrGlnLeuProPheThrArgThrLeuSerGlyAlaValPheHisAspMetGlyAspAla
                                                                                                               561 AlaAlaAsnPheLysArgMetLysLeuLysHisGlySerGlyLeuGlyValArgTrpPhe
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Isolated nucleotide sequences of Neisseria meningitidis which can used in the diagnosis and treatment of N. meningitidis infection other Neisserial infections, for example, N.gonorrhoea
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Scarselli M,
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Ratti G,
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C, Mora M,
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99US-0132068
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Rappuoli R, Pizza M;
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30-APR-1999;
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38988 TCCGGCCTTGCGCGTTTCCAGCCCGGTATGCCGTACGACCTCGACCTGCTGCTGCTCGACTTC 39047 38388 AGCCCCGACACCGAATCAGTCAAATTAAAAACCCAAATTCCCCGTCCTCATCGACACGCAG 38447 GluValLeuAspLysGluGlnThrGlyPheLeuAlaGluGluAlaProAspAsnValLys 100 GlnGlnAlaLeuGluGlnAsnGlyHisTyrSerGlyAlaSerValGlnAlaAspPheAsp 280 38808 TCCGTCCTCGGCGCGGTAACGCGCAAAGCCTACCCGCTTGCCAAGCTCGGCAATACGCAG 38748 AACTGGCAGCAGCCGGTAGGCAGCGATTTCGATCAGGACAGTTGGGAAAACAGCAAAACT SerGlyLeuAlaArgPheGlnProGlyThrProTyrAspLeuAspLeuLeuLeuAspPhe AspSerGluIleLysAspMetValGluGluHisLeuProLeuIleThrGlnGlnGlnGlu AsnTrpGlnGlnProValGlySerAspPheAspGlnAspSerTrpGluAsnSerLysThr SerValLeuGlyAlaValThrArgLySGlyTyrProLeuAlaLySLeuGlyAsnThrArg AlaalaValAsnProAspThrAlaThrValAspLeuAsnValValValAspSerGlyArg ProllealaPheGlyAspPheGluIleThrGlyThrGlnArgTyrProGluGlnIleVal SerProAspThrGluSerValLysLeuLysProLysPheProValArgIleAspThrGln 92934 601 3 5 0 Matches: Conservative: Mismatches: Indels: Gaps: US-09-857-669-2 (1-609) x AAA81473 (1-92934) 1.14e-279 3136.00 99.18% 98.69% 98.83% Percent Similarity:
Best Local Similarity:
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DB: 261 81 161 201 221 241 38448 38628 38868 qq 용 g g q a q ò qq ð qq δ q ò Q ò 셤 ò ò 9 ô ò ò ò ò ò ò

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19048 CAACAGGGCTCGAACAAAACGGGCATTATTCCGGCGCGTCCGTACAAGCCGACTTCGAC
                                                 LeuGluThrGlyIleArgLeuAspSerGluTyrGlyLeuGlyGlyLysIleAlaTyrAsp
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The present invention describes the full length genome of
Nelsseria meningitidis B (NMB). The sequences in AAF21544 and AAF21607
CO AAF21613 represent fragments of the NMB genomic sequence, as the
Sequence was too long to go in a record on its own it was split into B
Sequence by 4980 bp (i.e. the last 4980 bp of AAF2154 is repeated at
the beginning of AAF21607, the last 4980 bp of AAF2154 is repeated at
the beginning of AAF21608, and so on). AAF21545 to AAF21589 to
the beginning of AAF21608, and so on). AAF21545 to AAF21589 to
AAF21606 represent PCR primers which are used in the exemplification of
the present invention. The NMB genome and fragments from it have
the present invention. The NMB genome and fragments from it have
the present invention of an be used in vaccines and gene therapy.
Nelsseria nucleic acids, proteins and/or antibodies which binds to the
proteins can be used in compositions for treating or preventing infection
the presence of Nelsserial bacteria or of antibodies raised to Nelsserial
bacteria or opputers, computer memory, computer storage medium or computer
the databases can be used in a search to identify open reading frames (ORFs)
or coding sequences within the NMB genome. The DNA sequences provide
turcher opportunities to find antigance or membrane proteins which are
more effective in vaccines than the outer membrane proteins which are
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Masignani V;
Rappuoli R;
                                                                                                                                               Neisseria meningitidis; Neisseria gonorrheae; Immunogenic; vaccine; diagnosis; antigen; detection; infection; gene therapy; antibacterial;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Neisseria meningitidis B full length genome sequence and open reading frames are used to detect, treat and prevent Neisserial infections .
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                                                                                                            Neisseria meningitidis B nucleotide sequence SEQ ID NO:114.
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Gaps:
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AAF21613 standard; DNA; 172325
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Frazer CM, Grandi G;
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                                                                                                                                          The present sequence is a putative version of the Neisseria menigitidis strain H44/76 BASB040 coding sequence. The protein produced from this gene is similar to the D15 outer membrane protein of the bacterium. The gene, its protein, antibodies, antagonists and agonists can be used to diagnose and treat bacterial diseases such as those leading to upper respiratory tract infections, bacteraemia and menigitis. In addition, they can be used in vaccines for use against cancer and autolmmune diseases.
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                                                                                                 Novel BASB040 polypeptides of Neisseria meningitidis useful for diagnostic, prophylactic and therapeutic purposes against microbial diseases comprise a specific amino acid sequence
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                represent novel Neisseria meningitis and N. genorrheae polynucleotides and polypeptides. AZZ457 to AZZ4576 and AZZ4616 to AZZ5473 represent PCR primers used in the exemplification of the present invention. The polypeptides, the polynucleotides, antibodies and compositions of the invention can be used as vaccines, as diagnostic reagents, and as immunogenic compositions. The polypeptides can be used in the manufacture of medicaments for treating or preventing infection due to Neisserial bacteria (e.g. meningitis and septicaemia), to detect the presence of Neisseria bacteria, or to raise antibodies. They may also be used to screen for agonists or attagonists, which may themselves have use as antibacterial agents. The polynucleotides of the invention
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                                                                                                                                                                                                                                                           Neisseria meningitidis; Neisseria gonorrheae; antigen; vaccine;
antigenic; diagnosis; immunogenic; infection; meningitis; septicaemia;
antibacterial; gene therapy; ds.
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Scarselli
LeuAlaProPheSerPheAsp1leAlaTyrGlyHisSerAspLysLysIleArgTrpHis
                               AsnPheLysArgMetLysLeuLysHisGlySerGlyLeuGlyValArgTrpPheSerPro
                                                                                                                                                                                                                                         gonorrheae ORF 286 partial DNA sequence SEQ ID NO:1193
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Scalato E, S
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Petersen J, Pizza M, Rappuoli R,
                                                                                                                                                                            BP.
                                                                                                                        IleSerLeuGlyThrArgPhe 609
                                                                                                                                                                           AAZ53622 standard; DNA; 1569
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98US-0094869.
98US-0098062.
98US-0103749.
98US-0103794.
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P-PSDB; AAY74860.
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09-OCT-1998;
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25-FEB-1999;
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Tettelin H,
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02-SEP-1998;
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                                                                                                                                                                                                                                         Neisseria
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                                                                                                                          MetMetIleLysProThrAlaLeuLeuLeuProAlaLeuPhePheProHisAlaTyr
0 other;
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                              Length:
Matches:
Conservative:
Mismatches:
C; 393 G; 266 T;
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2653.00
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83.61%
BP; 388 A; 522
                                                              Best Local Similarity:
Query Match:
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 Sequence 1569
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sLeuGluThrGlyIleArgLeuAspSerGluTyrGlyLeuGlyGlyLysIleAlaTyrAs 320
                                                                                                                                                                                                                                                                                                                                                                                                                                                probe; amplification; vaccine carrier; biological remediation; ds.
       PTyrTyrAsnLeuPheAsnLysGlyTyrIleGlySerValValTrpAspMetAspLysTy
                                                                                                                                 yGlyIleTrpTyrValArgAspArgAlaGlyIleAspAlaArgLeuGlyAlaGluPheLe
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GES BLOTECHNOLOGISCHE FORSCHUNG MBH.
DEKEL DEUT KREBSFORSCHUNGSZERTEUM.
MEDIZINISCHE HOCHSCHULE HANNOVER.
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This invention describes novel DNA sequences (1) for specific detection of Pseudomonas putida KT2440. The invention also describes (1) recombinant expression vector containing (1); (2) prockaryotic or eucharyotic cells transformed or transfected with (1) or the vector of cultaryotic cells transformed or their fragments, of (1) and synthetic or expression products, or their fragments, of (1) and synthetic proteins or peptides with the same sequences (A); (5) poly- or mono-clonal antibodies (Ab) that react specifically with (A); (6) hybridoma cells that produce the monoclonal Ab of (5); (7) transgenic plants that contain transformed or transfected cells of (2); (8) and the same of an are used as probes to detecting KT2440 using a labeled (1) or Ab as probe; and (9) DNA chips detecting KT2440 using a labeled (1) or Ab as probe; and (9) DNA chips carrying one or more (1). (1), and their fragments, are used as probes to detect and isolate full-length cDNAs and/or to amplify such cDNAs by polymerase chain reaction, and for production of transgenic plants. (1), or attbodies that recognize their expression products, are used for celetecting the presence of KT2440, particularly in presence of other or sample of the bacteria classified as safe, by the National Institutes of Health, for genetic engineering work, e.g. as microbial production strains, for genetic engineering and as vaccine carriers. (1) are exclusive to KT2440 with no significant homology with sequences in other bacteria (specifically the closely clasted pathogen P: acruginosa). Compared with other 'safe' bacteria, it has greater catabolic activity and better survival in, and adaptation to, the rhizosphere and soil.
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                                                               KT2440, useful as presence of other
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115
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allow detection in
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Location/Qualifiers 1..1737

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(first entry)

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BASB067 gene; outer membrane protein; vaccine; antibiotic; antibacterial; screening; infection; diagnosis; therapy; ds
                                                Haemophilus influenza strain Rd KW20 BASB067 gene.
                                                                                                            Haemophilus influenzae.
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                                                                                                                                                                                                                                                                                                                                                                                                                                   ACC-----AACCTGCTGCACGGCAACGTATTGCTCAAAGGCCTGACCACACTCGGCCAC 969
                                                                                    576
                                                                                                                                                                          397 AlaGluPheLeuAlaGluGlyArgLysIleProGlySerAspIleAspLeuGlyAsnSer 416
            LeuAspSerGluTyrGlyLeuGlyGlyLysIleAlaTyrAspTyrTyrAsnLeuPheAsn 326
                                                                                                                                                                                                                                                                                   745 CTCAAGTACCAACGCGAAGAATATCGCCTG---GGTGACGACTCCGGTTTGAGCAACCTG 801
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        357 AsnTyrTrpThrSerAsnValSerTyrAsnArgSerThrThrGlnAsnLeuGluLysArg
                                                                                                                                                                                                                                                                                                                                                                          CAAGGCCAC----AGCTATGGCTGGGAAACCGAACTGTCGGCCCCGCCCAGAACGTC
                                                                                                            -----TyrGluThrThrLeuAlaAlaGlyIleSerGlnProArgAsnTyrArgGly
                                                                                                                                                                                                           377 AlaPheSerGlyGlyIleTrpTyrValArgAspArgAlaGlyIleAspAlaArgLeuGly
                                                                                                                                                                                                                                                                                                            417 HisAlaThrMetLeuThrAlaSerTrpLysArgGlnLeuLeuAsnAsnValLeuHisPro
                                                                                                                                                                                                                                                                                                                                                                                                                                                          469 PhePheThrProGluAsnLysLysLeuGlyThrPheIleIleArgGlyGlnAla-----
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           GlyTyrThrValAlaArgAspAsnAlaAspValProSerGlyLeuMetPheArgSerGly
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          507 GlyAlaSerSerValArgGlyTyrGluLeuAspSerIleGlyLeuAlaGlyProAsnGly
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          547 ArgThrLeuSerGlyAlaValPheHisAspMetGlyAspAlaAlaAlaAsnPheLysArg
                                   TTCTCGACGACGTCGGGCCGCGGCAAGGCCAACTGGACCCGCCACTGGGTCAACCCA
                                                                                                                                    577 GGCCTGTGGTATGACATTCCCCTCGACCGCTGACCGACGAGTTGCGGGC
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           SerValLeuProGluArgAlaLeuLeuValGlySerLeuGluTyrGlnLeuProPheThr
                                                            LysGlyTyrIleGlySerValValTrpAspMetAspLys----
                                                                                                                                                                                                                                                                                                                                                        437 GluAsnGlyHisTyrLeu-----
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AAA50269
ID AAA50:
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The present sequence is that of the coding region of the BASB067 gene of Haemophilus influenzae strain Rd KW20. It encodes a consistent oacid surface expressed protein (see AAF95820) that is recognised by the immune system. The invention relates to recombinant materials and methods for the production of BASB067 con polypeptides and polymorclectides, for use especially in therapeutic and prophylactic vaccines. It also relates to methods for using such polypeptides and polymorclectides in the prevention and cuch polypeptides and polymorclectides in the prevention and diseases associated with microbial infections, and assays for detecting expression or activity of BASB067 polypeptides or activity of polypeptides or polymorclectides. A polymorlectide having at least 85% identity to the present sequence can be used in the recombinant production of BASB067 immunogenic polypeptides in transformed host cells, and
                                                                                                                                                                                                                                                                                                                  BASB067 polypeptide and polynucleotide from Haemophilus influenzae are used for diagnosing and treating H. influenzae infections -
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        AlaAlaAspLeuSerGluAsnLysAlaAlaGlyPheAlaLeuPheLysAsnLysSerPro 42
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263
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Matches:
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374.00
36.88%
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04-FEB-2000; 2000WO-EP00887
                                                         99GB-0002880
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Best Local Similarity:
                                                                                                                                                                                                                                                         P-PSDB; AAY95820
                                                         09-FEB-1999;
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AAA50269 standard; DNA; 1737 BP.

Q Q	73	ACCGTTGATATTGAAGTTCAAGGCATTCGTGGTTTCCTGTGCTGTGCGTAATACAGAT	129
ογ	43	AspThrGluSerValLysLeuLysProLysPhePr	62
QQ	130	CTCATGTTAATAAAAAAAAAAAAAAAAAAAAAAAAAAAA	153
ογ	63	GluileLysAspMetValGluGluHisLeuProLeulleThrGlnGlnGluGluVal	82
ga	154		201
ò	83	LeuAspLysGluGlnThrGlyPheLeuAlaGluGluAlaProAspAsnValLysThrMet	102
qq	202		213
ò	103		119
QQ	214	TIGGGTGTTTGGTTATTATGAATCTTCGGTGCTTTTGAACGAAAACAGGGTCAAGGC	273
ογ	120	GlyAlaTyrThrValHisIleThrProGlyProArgThrLysIleAlaAsnVal	137
ą	274		333
ò	138	GlyvalalalleLeuGlyAspIleLeuSerAspGlyAsnLeuAlaGluTyrTyrArgAsn	157
QQ	334		378
٥'n	158	AlaLeuGluAsnTrpGlnGlnProValGlySerAspPheAspGlnAspSerTrpGluAsn	177
QC	379		438
ò	178	SerLysThrSerValLeuGlyAlaValThrArgLysGlyTyrProLeuAlaLysLeuGly	197
q	439		498
ογ	198		217
g	499	ATTCACGTTTAGAAATCAGCCCTGAAACCCATCAAGCATGGTGGCGAATGTTATTTGAT	558
οy	218		237
q	559	AGTGGTGTCCGTTATCATTATGGCAATATTACTTTTAGCCATTCACAAATTCGGGAT	615
οy	238	GlnIleValSerGlyLeuAlaArgPheGlnProGlyThrProTyrAspLeuAspLeuLeu	257
g	616		675
٥'n	258		277
a a	919	TCGGATTTAACCAGCGATTTTCCATCTTCAAATTGGTTTAGCTCAGTATTAGTTCGCCT	735
٥٧	278		297
QQ	736		792
δ	298		317
qq	793	AAAAATGCGATGGGATGTGGGCTTTTCTACTGATGGCGGCGTTCACGGACAAATA	852
ογ	318	AlaTyr	319
qq	853	GGCTGGACAAAACCTTGGATTAATAGCCGTGGACATAGTTTGCGTTCAAATCTTTATCTC	912
ζ	319		319
q	913	TCTGCACCAAAACAAACTCTAGAGGCAACTTATCGAATGCCACTGCTTAAAAATCCATTA	972
ογ	320	AspTyrTyrAsnLeuPheAsnLysGlyTyrIleGlySerValValTrpAspMetAspLys	339
qq	973	AATTATTACTATGATTTTGCCGTCGGTTGGGAAGGGGAAAAAGAGAATGATACCAATACG	1032
ογ	340	TyrGluThrThrLeuAlaalaGlyIleSerGlnProArgAsnTyrArgGlyAsnTyrTrp	359
QQ	1033	AGAGTGCTTACGTTGTCAGCGTTACGTTATTGG	1065

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1066 AATAATGCGCATGGTTGGCAATATTTTGGCGGACTTCGTATGCGATACGACAGTTTTACA 1125
                                                                                              CAAGCGGATATCACTGATAAAACCTTACTTCTTTATCCAACTGTTGGATTTACTCGTACT 1185
                                                                                                                                                               1186 CGATTACGTGGTGCTTCCTTTGCCACTTGGGGC-------GATGTGCAAAA 1230
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GCTGGTGGCGATCGTAGTGTGCGCGTTACAGATAAAAAATTCGGCCTAAAATAGA 1467
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                                                             370 ThrGlnAsnLeuGluLysArgAlaPhe------SerGlyGlylleTrpTyrVal 385
                                                                                                                               386 ArgAspArgAlaGlyIleAspAlaArgLeuGlyAlaGluPheLeuAlaGluGlyArgLys 405
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 1648 GCGATTAAATTTGATATTGCCACACCCATTCGTGATAAAGATAACAGCAAAAATATTCAA 1707
 -- AsnValSerTyrAsnArgSerThr 369
                                                                                                                                                                                                  IleProGlySerAspIleAspLeuGlyAsnSerHisAlaThrMetLeuThrAlaSerTrp 425
                                                                                                                                                                                                                                                                426 LysArgGlnLeuLeuAsnAsnValLeuHisProGluAsnGlyHisTyrLeuAspGlyLys 445
                                                                                                                                                                                                                                                                                                                               446 IleGlyThrThrLeuGlyThrPheLeuSerSerThrAlaLeuIleArgThrSerAlaArg 465
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                525 AsnGlySerValLeuProGluArgAlaLeuLeuValGlySerLeuGluTyrGlnLeuPro 544
                                                                                                                                                                                                                                                                                                                                                                                                 466 AlaGlyTyrPhePheThr -- - ProGluAsnLysLysLeuGlyThrPheIleIleArgGly 484
                                                                                                                                                                                                                                                                                                                                                                                                                                                                  GlnAlaGlyTyrThrValAlaArgAspAsnAlaAspValProSerGlyLeuMetPheArg 504
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               565 LysArgMetLysLeuLysHisGlySerGlyLeuGlyValArgTrpPheSerProLeuAla 584
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                                                                                                                                                                                                                                                                                                1249 AAACGA------
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                                                                                                                                                                                                                               1231 ATT-----ACTTTTGATTTAAGC-----
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The present sequence is that of the coding region of the BASB067 gene of Haemophilus influenzae non-typeable (Nthi) strain 289. The DNA was isolated by PCR using primers (see AAA50271-72) specific for the BASB067 gene. It encodes a 576-amino acid surface exposed protectin (see AAY95821) that is recognised by the immune system. The invention relates to recombinant materials and methods for the production of BASB067 polypeptides and polynucleotides, for use especially in therapeutic and prophylactic vaccines. It also relates to methods for using such polypeptides and polynucleotides in the prevention and treatment of microbial diseases, in diagostic assays for detecting expression or activity of BASB067 polypeptides or polynucleotides. A polynucleotide having at least to method the microbial infections, and assays for detecting expression or activity of BASB067 polypeptides or polynucleotides. A polynucleotide having at least a second the present sequence that the present sequence that the present sequence that the present sequence that the present sequence the present sequence that the present sequence the present sequence that the present sequence that the present sequence that the present seque
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       polypeptide and polynucleotide from Haemophilus influenzae are r diagnosing and treating H. influenzae infections -
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     99 ValLysThrMetLeuArgSerLysGlyTyrPheSerSerLysValSerLeuThrGluLys
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        (nucleotides 61-1731) can be used in the recombinant production of BASB067 immunogenic polypeptides in transformed host cells, and in vaccine compositions.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Sequence 1731 BP; 509 A; 322 C; 386 G; 514 T; 0 other;
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Indels:
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Matches:
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355,50
38.01%
23,31%
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                 /*tag= a
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61.1728
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P-PSDB; AAY95821.
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Best Local Similarity:
Query Match:
                                                                                                                                                                  WO200047737-A1
                                                                                                                                                                                                                                                                                                                  09-FEB-1999;
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                                           sig_peptide
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1075 TGGCAATATTTTGGCGGACTT-------CGTACGCGATACGACAGTTTTACA 1119
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1216 GTGCAAAAATTACTTTTGATTTAAGCAAATGGAATTTGCTTTTATA 1275
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                                                                                                                                                   194 AlaLysLeuGlyAsnThrArgAlaAlaValAsnProAspThrAlaThrValAspLeuAsn 213
                                                                                                                                                                                                                                                                  600
                                                                                                                                                                                                                                                                                                        ArgTyrProGluGlnIleValSerGlyLeuAlaArgPheGlnProGlyThrProTyrAsp 253
                                                                                                                                                                                                                                                                                                                                                                                    LeuAspLeuLeuLeuAspPheGlnGlnAlaLeuGluGlnAsnGlyHisTyrSerGlyAla 273
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        ------AspTyrTyrAsnLeuPheAsnLysGlyTyrIleGlySerValValTrp 335
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  336 AspMetAspLysTyrGluThrThrLeuAlaAlaGlyIleSerGlnProArgAsnTyrArg 355
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              356 GlyAsnTyrTrpThrSerAsnValSerTyrAsnArgSerThrThrGlnAsnLeuGluLys 375
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 GlyAlaGluPheLeuAlaGluGlyArgLysIleProGlySerAspIleAspLeuGlyAsn 415
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                                   -----GATGCGCTACGTAAAAACTTGCCAAAAGAAGGCGTTTTGGTTGAACAAA 420
                                                                                                                                                                                                                                                                                                                                                                                                                      558 ATGAATAATTIGICGGATTTAACCAGCGATTTTTCATCTTCAAATTGGTTTAGCTCAGTA 717
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     835 CACGGACAAATTGGCTGGACAAAACCTTGGATTAATAGCCGTGGACATAGTTTGCGTTCA 894
TyrTyrArgAsnAlaLeuGluAsnTrpGlnGlnProValGlySerAspPheAspGlnAsp 173
                                                                                               ---ATCCGTGACGATTATCTCAATAATATTCTTAACATCAAATCTGGCGATCCATATTTA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   ValValValAspSerGlyArgProIleAlaPheGlyAspPheGluIleThrGlyThrGln
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       376 ArgAlaPheSerGlyGlyIleTrpTyrValArgAspArgAlaGlyIleAspAlaArgLeu
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                                                                           SerTrpGluAsnSerLysThrSerValLeuGlyAlaValThrArgLysGlyTyrProLeu
                                                                                                                                                                                         GGGAACTTTAAAATTTCACGTTTAGAAATCAGCCCTGAAACCCATCAAGCATGGTGGCGGA
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461 ArgThrSerAlaArgAlaGlyTyrPhePheThr -- ProGluAsnLysLysLeuGlyThr 479

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                                                                                                                                                                                                                                                                                                                    Outer membrane protein; omp85; gonococcal infection; symptomatic disease; meningococcal infection; protective immune response; vaccine; ss.
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                                                                                            ---GTTGCTCGTGCTGAAATCGGGTATTTACATACAAAAGATATTGAAAAATTCCGCCT 1386
                                                                                                                               1507 GAAAATCAATATCAAGTTTATCCAAATTGGTGGCGGCAACTTTTGCAGATAGTGGATTA 1566
                                                   519
                                                            AlaAlaAlaAsnPheLysArgMetLysLeuLysHisGlySerGlyLeuGlyValArgTrp
520 GlyLeuAlaGlyProAsnGlySerValLeuProGluArgAlaLeuLeuValGlySerLeu
                                                                                                               GluTyrGlnLeuProPheThrArgThrLeuSerGlyAlaValPheHisAspMetGlyAsp
                     480 PhellelleArgGlyGlnAlaGlyTyrThrValAlaArgASpAsnAlaAspValProSer
                                                   500 GlyLeuMetPheArgSerGlyGlyAlaSerSerValArgGlyTyrGluLeuAspSerIle
                                                                                                                                                                           580 PheSerProLeuAlaProPheSerPheAspIleAlaTyrGlyHisSerAsp-----
                                                                                                                                                                                                                                                                                                                                                                                                               "outer membrane protein 85"
                                                                                                                                                                                                                    1687 AGCAAAATTTTACATTTTACATCGGACTTGGTACC 1722
                                                                                                                                                                                                           ---LysLysIleArgTrpHisIleSerLeuGlyThr 607
                                                                                                                                                                                                                                                                                                     outer membrane protein (omp) 85.
                                                                                                                                                                                                                                                                                                                                                          Location/Qualifiers
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P-PSDB; AAY84946.
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                                                                                                                                                                                                                                                                                                     DNA encoding
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The present sequence encodes an outer membrane protein (omp) 85 of Neisseria gonorrhoeae. The omp polypeptides and polynucleotides are useful in compositions for use in the prevention, treatment and diagnosis of non-symptomatic gonococcal infection or meningococcal infection and hybridisation complexes. They are also useful for the detection of hybridisation complexes. Antigens and entibodies specific omp proteins also provide diagnostic, therapeutic and prophylactic compositions for the treatment or prevention of the infections described above. The antibodies are useful for inducing a protective immune response in humans or animals with N gonorrhoeae, N, meningitidis, or other Neisseria species. The proteins, antibodies and polynucleotide sequences of the present invention may also be used in the screening and development of chemical compounds such as drugs or vaccines.
New isolated outer membrane protein 85 of Neisseria gonorrhoeae and N. meningitidis useful for vaccine, therapeutic and diagnostic compositions for gonococcal or meningococcal infections
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           GluGlnThrGlyPheLeuAlaGluGluAlaProAspAsnValLys....ThrMet 102
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 585 GAAGCGACCGGTTCGACCGCCAGAAATTCGCCCAAGACATGGAAAAAGTAAACGGACTTCT 744
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   864 AAAGTGTCGATT-------GAAGGCGACACCAACGAGTCCCC
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Sequence 2505 BP; 669 A; 787 C; 621 G; 428 T; 0 other;
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                                                                                                                                         Claim 6; Fig 2; 98pp; English.
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CHIRON SPA.
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09-MAR-2000; 2000GB-0005698.
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                      GTCGAGCTTTTGGGCTACTTCGAC----AACGTACAGTTTGATGCCGTCCCGCTTGCC 1277
                                                              1398 GACAACCTGTTCGGTACGGGC-----AAGTCGGCCGCCCTGCGCCCTCGCGAAGCAAA 1451
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                                                                                              GluThrGlyIleArgLeuAspSerGluTyrGlyLeuGlyGlyLysIleAlaTyrAspTyr 321
                                                                                                                                              322 TyrAsnLeuPheAsnLysGlyTyrIleGlySerValValTrpAspMetAspLysTyrGlu 341
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LeuGluGlnAsnGlyHisTyrSerGlyAlaSerValGlnAlaAspPheAspArgLeuGln 283
                                                Gly-----AspArgValProValLysValSerValThrGluValLysArgHisLysLeu 301
                                                                                                                                                                                              ThrThrLeuAlaAlaGlyIleSerGlnProArgAsnTyrArgGlyAsnTyrTrpThrSer 361
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                                                                                                                      1338 GACTTGAGCGCGGCTGGCTTCAGGATACCGGCTTGGTCATGTCCCGGCGTATCGCAG
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The sequence represents a DNA encoding a Neisseria meningitidis serogroup A 85 kDa antigenic protein. Neisseria meningitidis colonises the pharynx, causing meningitis and, occasionally, septicaemia in the absence of meningitis. This antigenic protein is useful in the manufacture of a medicament for treating or preventing infection due to Neisseria bacteria, such as meningitis and septicaemia. It is also useful as a diagnostic reagent for detecting the presence of Neisseria bacteria or antibodies raised against Neisseria, and as a reagent for raising the antibodies. The Neisserial nucleotide sequences can be expressed in a variety of different expression systems, for example, mammalian cells, Novel 85 kDa antigen from Neisseria meningitidis and Neisseria gonorrhoeae, useful in the manufacture of a medicament for treating and preventing .Neisserial bacteria infection -/*tag= c /product= "Mature N. meningitidis serogroup A antigen" CCTTTGGGCCCGATGAAATTCATCTACGCCTACCCGCTGAAGAAAAAACGGGAAGAAAA 2399 2220 AGAACCTATACCGCCGCGGAAAACGGTAACAAAATCGGTTTACTCGGAAAACGCGCAT 2279 ProLeuAlaProPheSerPheAspIleAlaTyr------GlyHisSerAspLys .---LysLeuLysHisGlySerGlyLeuGlyValArgTrpPheSer B antigen; pharynx; meningitis; septicaemia; mammalian infection; baculovirus; yeast; ds. "N. meningitidis serogroup A antigen" Neisseria meningitidis serogroup A antigenic protein DNA. 2400 ATCCAACGTTCCAGTTCCAGCTCGGCACGTTC 2435 LysileArgTrpHisileSerLeuGlyThrArgPhe 609 Holst J; Α, Location/Qualifiers Rappuoli

ខ	bacu	baculoviruses, plants, bacteria		and yeast.			
× o	Sedn	Sequence 2379 BP; 636	A; 755 C;	596 G; 392 T; 0 c	other;		Οy
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Pred.	NO.		.23e-14		2379		Qy
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     --ArgSer 368
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--SerSerLysValSerLeuThrGlu 117

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                                                                                                                                                                                                                                                                                                                                                                                                                                        The present sequence encodes a Neisseria gonorrheae protein. The protein is used to produce the compositions of the invention. The specification describes a composition, comparising a Neisseria meningitidis serogroup B outer membrane preparation and an immunogenic component. The immunogenic component is protein disclosed in W099/57280, W099/31132, W099/3813, W099/5863, W099/58671, W099/28273, W096/28912, W099/57813, TbpA, TbpB, PilC, OpA, or OmpBS. The composition is used for making a medicament for treating or preventing infection due to Neisserial bacteria; a diagnostic reagent for detecting the presence of Neisserial bacteria, and/or a reagent which can raise antibodies against Neisserial bacteria. It may
                                                                                                                                                                                                                                                                                                                                                                      Composition for treating or preventing infection to, detecting, or for raising antibodies against Neisserial bacteria, comprises an N. meningitidis serogroup B outer membrane preparation and an immunogenic
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            GluGlnThrGlyPheLeuAlaGluGluAlaProAspAsnValLys-----ThrMet 102
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          protein; outer membrane protein; Neisserial infection;
                                                                                                                   1.2379/
/*tag= a
/product= "Nelsseria serogroup B protein"
/*tag= b
64..2376
/*tag= c
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Sequence 2379 BP; 636 A; 755 C; 596 G; 392 T; 0 other
                                        Nucleotide sequence of a Neisseria gonorrheae protein
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              144
86
246
157
28
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Matches:
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                                                                                                                                                                                                                                                                                                                                                                                                                        Disclosure; Page 64-65; 83pp; English.
                                                                                                              Location/Qualifiers
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                                                                                                                                                                                                                                                                                                                     Giuliani
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36.39%
22.78%
8.08%
                     (first entry)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   also be used as a vaccine
                                                                                                                                                                                                                                                                                                                    Rappuoli R,
                                                                                         Neisseria gonorrheae.
                                                                                                                                                                                                                                                                                                                                        2001-451895/48,
                                                                                                                                                                                                                                                                                                 (CHIR-) CHIRON SPA
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Best Local Similarity:
Query Match:
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                    17-SEP-2001
                                                                                                                                                                       mat_peptide
                                                                                                                                                     sig_peptide
                                                                                                                                                                                                                        26-JUL-2001
                                                                                                                                                                                                                                                                                                                                                                                                    component
                                                                                                                                                                                                                                                                                                                     Pizza M,
AAH42129;
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1339 GACAACCTGTTCGGTACGGGC-----AAGTCGGCCCCTGCGCGCCTCGCGAAGCAAA 1392
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   GACTIGAGCGCGGCTGGGTTCAGGATACCGGCTTGGTCATGTCCGCCGCGTATCGCAG 1338
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          1393 ACCACGCTCAACGGCTCGCTGTCG------TTTACCGACCCGTACTTCACGGCA 1440
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   1441 GACGGGGTCAGCCTGGGCTACGATATTTACGGAAAAGCCTTCGACCCGCGCAAAGCATCG 1500
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               985 AACGCCGGAACCAAAACCGTCGATTTCGTCCTGCACATCGAACCGGGCCGGAAAATCTAC 1044
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        1045 GTCAACGAAATCCACATCACCGGCAACAACAAAAACCCGCGACGAAGTCGTGCGCCGCGAA 1104
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               322 TyrAsnLeuPheAsnLysGlyTyrIleGlySerValValTrpAspMetAspLysTyrGlu 341
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            264 LeuGluGlnAsnGlyHisTyrSerGlyAlaSerValGlnAlaAspPheAspArgLeuGln 283
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                302 GluThrGlyIleArgLeuAspSerGluTyrGlyLeuGlyGlyLysIleAlaTyrAspTyr 321
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  SerAspIleAspLeuGlyAsnSerHisAlaThrMetLeu.....ThrAlaSerTrp 425
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Gly-----AspArgValProValLysValSerValThrGluValLysArgHisLysLeu 301
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                                                                                                                                                                                                                                                                                                                                                                                                                                                          891
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          928 AACCGCATGGGCTCGGCAGGCTACGCATACAGCGAAATC---AGCGTACAGCCGCTGCCG 984
                                                                                                                                                                                                                                              136 AsnValGlyValAlaIleLeuGlyAspIleLeuSerAspGlyAsnLeuAlaGluTyrTyr 155
                                                                                                                                                                                                                                                                                                                                                                                       SerAspPheAspGlnAspSerTrpGluAsnSerLysThrSerValLeuGlyAlaValThr 187
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    LysAspGlyAlaTyrThrValHisIleThr-----ProGlyProArgThrLysIleAla
                                                                                                                                                                       745 GACAAAACCAGGCAGACCATCAAAATCACGTCCACGAAGGCGGACGTTTCCGCTGGGGC
                                                                                                                                                                                                                                                                                                                 -----GAAGGCGACACCAACGAAGTCCCC
                                                                                                                                                                                                                                                                                                                                                                                                                                                       841 AAGGCCGAACTGGAAAAACTGCTGACCATGAAGCCCGGCAAATGGTACGAA-----
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              188 ArgLys------GlyTyrProLeuAlaLysLeuGlyAsnThrArgAlaAlaVal
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        AsnProAspThrAlaThrValAspLeuAsnValValValAspSerGlyArgProIleAla
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         ... ArgLeuGlyAlaGluPheLeuAlaGluGlyArgLysIleProGly
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                                                                                                                                                                                                                                                                                                                 805 AAAGTGTCGATT-----
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The sequence represents a DNA encoding a Neisseria gonorrhoeae 85 kDa antigenic protein. N. gonorrhoeae is closely related to N. meningitidis, which colonises the pharynx, causing meningitis and, occasionally, septicaemia in the absence of meningitis. This antigenic protein is useful in the manufacture of a medicament for treating or preventing infection due to Neisseria bacteria, such as meningitis and septicaemia. It is also useful as a diagnostic reagent for detecting the presence of Neisseria bacteria or antibodies raised against Neisseria, and as a reagent for raising the antibodies. The Neisserial nucleotide sequences can be expressed in a variety of different expression systems, for example, mammalian cells, baculoviruses, plants, bacteria and yeast.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Novel 85 kDa antigen from Neisseria meningitidis and Neisseria gonorrhoeae, useful in the manufacture of a medicament for treating and preventing Neisserial bacteria infection -
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           470 rescenedadesegentes de la respecta del respecta de la respecta de la respecta del respecta de la respecta del respecta della respecta de la respecta della respecta del
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  54 ProVal-ArgileAspThrGlnAspSerGluIleLysAspMetValGluGluHisLeuPr 73
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/*tag* c
/product* "Mature N. gonorrhoeae antigen"
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                                                                                                                                                                                                                                                                                                                                                                                                       (CHIR-) CHIRON SPA. (STAT-) STATENS INST FOLKEHELSE.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Claim 6; Fig 2; 92pp; English.
                                                                                                                                                                                                                                     28-NOV-2000; 2000WO-IB01851.
                                                                                                                                                                                                                                                                                                        29-NOV-1999; 99GB-0028197.
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                                                                                                  WO200138350-A2
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8	GAAGGCGACACCAAGGTCCCCAAAGCGGAACTGGAAAAACTGCTGA	
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q	866 CCATGAAGCCCGGCAAATGGTACGAA	
ογ	176 luAsnSerLysThrSerValLeuGlyAlaValThrArgLysGlyTyrP 192	
q	893 GCCAGCAGATGACCGCCGTTTTGGGTGAGATTCAGAACCGCATGGGCTCGGCAGGCTACG 952	
ογ	192 roLeualaLysLeuGlyAsnThrArgalaAlaValasnProAspThrAlaThrValAspL 212	
qq	953 CATACAGGGGAAATCAGGGTACAGCGGCTGCCAAACGCCGAAACCGTCGATT 1009	
οy	212 euAsnValValValAspSerGlyArgProlleAlaPheGlyAspPheGlulleThrGlyT 232	
q	1010 TCGTCCTGCACATCGACCGGGCCGGAAAATCTACGTCAACGAAATCCACATCACCGGGA 1069	
ογ	232 hrGlnargTyrProGluGlnIleValSerGlyLeuAlaArgPheGlnProGlyThrProT 252	
ф	1070 ACAACAAAACCCGCGACGAGGTGGGCGGGGAATTGCGCCAAATGGAATCCGCGCCTT 1129	
δγ	252 yraspLeuAspLeuLeuAspPheGlnGlnAlaLeuGluGlnAsnGlyHisTyrSerG 272	
q	1130 ACGACACCTCCAAGCTGCAACGCTCCAAAGGGCGCGTCGAGCTTTTGGGCTACTTCGAC- 1188	
δ	AlaAspPheAspArgLeuGlnGly	
ф	1189AACGTACAGTTTGATGCCGTCCCGCTTCCCGCACCCCGACAAGTCGATTTGA 1243	
ογ	290 ysValSerValThrGluValLysArgHisLysLeuGluThrGlyIleArgLeuAspSerG 310	
đ	1244 ACATGAGCCTGACCGAGCTTCCACCGGCTCGACTTGAGCGCGGGCTGGGTACAGG 1303	
ογ	310 luTyrGlyLeuGlyGlyLysIleAlaTyrAspTyrTyrAsnLeuPheAsnLysGlyTyrI 330	
qq	:: 1304 ATACCGCCTGGTCATGTCCGCAGGCGTTTCCCAAGACAACCTGTTCGGTACGGGC 1359	
Οy	330 leGlySerValValTrpAspMetAspLysTyrGluThrThrLeu 344	
පි	1360AAGTCGGCCCCTGCGCGCCTCACGAAACCACGCTCAACGGCTCGCTGTCGT 1417	
ò	345AlaalaGlyIleSerGInProArgAsnTyrArgGlyAsnT 358	
QQ	1418 TTACCGACCCGTACTTCACGGCAGACGGGGTCCTGGGCTACGATGTTTACGGAAAG 1477	
δ	358 yrTrpThrSerAsnValSerTyrAsnArgSerThrThrClnAsnL 373	
qq	1478 CCTTCGACCCGCGAAAGCATCGACCAGCATCAAACAATATAAAACCACCACGGCAGGCG 1537	
ογ	373 euGluLysArgalaPheSerGlyGlyIleTrpTyrValArgAspArgAlaGlyIleAspA 393	
qq	1538 CAGGCATCCGCATGAGCGTGCCTGTTACCGAATACGACCGCGTGAATTTCGGTTTGGTGG 1597	
ογ	393 laargleuGlyAlaGluPheLeuA 401	
q	1598 CAGAACACCTGACCGTCAACACAACAAAGCGCCCAAACACTATGCCGACTTTATCA 1657	
ογ	401 laGluGlyArgLysIleProGlySerAspIleAspLeuGlyAsnSerHisAlaThrMetL 421	
ф	1658 AGAAATACGGCAAAAACCGACGGCACAGACTGGCAGCTTCAAAGGCTGGCTGT 1708	
ογ	421 euThralaSerTrpLysArgGlnLeuLeuAsnAsnValLeuHisProGluAsnG 439	
q	1709 ACAAAGGTACCGTCGGCTGGGGGCGCAACAAAACCGACGCGGTTATGGCCGACGCGCG 1768	
οy	439 lyH1sTyrLeuAspGlyLysIleGlyThrThrLeuGlyThrPheLe	
qq	1769	

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2081 TCTTCCCGATGCCCGCGGAAAGACGCGCGCACGTCCCGCCTGAGCCTGTTTGCCGACG 2140
                                                                                                                                                                                                                                                                                                                2201 GGGTTCAAAACATTTACGGCGCCGGCAATACCCATAAATCCACCTTTACCAACGAATGC 2260
                                                                                                                                                                                                                                                                                                                                                                                                    2036 TCAGCTACGGCGGCAAC------AAAAAAGCCAACGTCTCCGCCGAGCTGC 2080
                                                                                                                                                                                                                                                                              2141 CAGGCAGCGTGTGGGACGGCAAAACCTACGACGACAACAGCAGTTCCGCGGCGGCGCG 2200
                                                                                492 rgAspAsnAla---AspValProSerGlyLeuMetPheArgSerGlyGlyAlaSerSerV 511
                                                                                                                                                                     521 ··LeuAlaGlyProAsnGlySerValLeuProGluArgAlaLeuLeuValGlySerLeuG 540
                                                                                                                                                                                                                                                                                                 511 alArgGlyTyrGluLeuAspSerIleGly----- 520
                                                                                                                                                                                                                                                                                                                                                                                      590 leAlaTyr------GlyHisSerAspLysLysIleArgTrpHisIleSerLeuG 606
                                        ....-LysLeuGlyThrPheIleIleArgGlyGlnAlaGlyTyrThrValAlaA 492
                                                                                                                                                                                                              540 luTyrGlnLeuPro-----PheThrArgThrLeuSerGlyAlaValPheHisAspM 557
euIleArgThrSerAlaArgAlaGlyTyrPhePheThrProGluAsnLys----- 475
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Serogroup A protein; outer membrane protein; Neisserlal infection; vaccine; ss.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           /*tag= a
/product= Neisseria serogroup A protein"
1..63
1..63
64..2391
/*tag= c
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Nucleotide sequence of a Neisseria serogroup A protein.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Location/Qualifiers
1..2394
/*tag= a
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              AAH42130 standard; DNA; 2394 BP.
                                                                                                                                                                                                                                                         557 etGlyAsp------
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         17-SEP-2001 (first entry)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Neisseria meningitidis.
                                                                                                                                                                                                                                                                                                                                                                                                                                             11111 ||| ||| 2381 GCACGACGTTC 2391
                                                                                                                                                                                                                                                                                                                                                                                                                                606 lyThrArgPhe 609
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The present sequence encodes a Neisseria serogroup A protein. The protein is used to produce the compositions of the invention. The specification describes a composition, comprising a Neisseria meningitidis serogroup B outer membrane preparation and an immunogenic component. The immunogenic component is protein disclosed in WO99/57280, WO99/38134, WO99/34578, WO99/58634, WO99/5863, WO99/58633, MO99/58633, MO99/
                                                                                                                                                                                                                                                                                           Composition for treating or preventing infection to, detecting, or for raising antibodies against Neisserial bacteria, comprises an N. meningitidis serogroup B outer membrane preparation and an immunogenic
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               589
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   710 TCCGCATCCTCGATACCGACATCCAAACCAAGGAGACAAAACCAAGGAGGACCATCAAAA 769
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         TCGCCCGCAACCGCGTCGACATCGACATCACGATTGACGAGGGCAAATCCGCCAAAATCA 529
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    93
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         -----ProLysPhe 53
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Sequence 2394 BP; 655 A; 758 C; 586 G; 395 T; 0 other;
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Matches:
Conservative:
Mismatches:
Indels:
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                                                                                                                                                                                                                                                                                                                                                                                                                                Disclosure; Page 70-71; 83pp; English
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2000GB-0005699
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                                                                                                    (CHIR-) CHIRON SPA.
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Best Local Similarity:
Query Match:
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                      17-JAN-2000;
09-MAR-2000;
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TCGCCCTGCCCGGCAGCAACTGCAATACTACTCCGCCACCACAAACCTGGTTCT 1855 CATACAGCGAAATC---AGCGTACAGCCGCTGCCAAACGCCGAAACCGAAAACGGTCGATT 1009 .010 TCGTCCTGCACATCGAACCGGGCGGGAAAATCTACGTCAACGAAATCCACATCACGGGA 1069 1304 ATACCGGCCTGGTCATGTCCGCAGGCGTTTCCCAAGACAACCTGTTCGGTACGGGC---- 1359 TACCGACCCGTACTTCACGGCGAGAGGGGTCAGGCTGGGCTACGATGTTTACGGAAAAG 1477 CAGGCATCCGCATGAGCGTGCCTGTTACCGAATACGACCGCGTGAATTTCGGTTTTGGTGG 1597 ACAAAGGTACCGTCGCCTGGGGGCGCAACAAAACCGACGCGCGTTATGGCCGACGCGCG 1768 CAGAACACCTGACCGTCAACACCTACAACAAGGGCCCAAACACTATGCCGACTTTATCA 1657 272 lyAlaServalGlnAlaAspPheAspArgLeuGlnGly-----AspArgvalProvalL 290 ysValSerValThrGluValLysArgHisLysLeuGluThrGlyIleArgLeuAspSerG 310 lyHisTyrLeuAspGlyLysIleGlyThrThrLeuGlyThrPheLeuSerSerThrAlaL 459 ------LysLeuGlyThrPheIleIleArgGlyGlnAlaGlyTyrThrValAlaA 492 GCCAGCAGATGACCGCCGTTTTGGGTGAGATTCAGAACCGCATGGGCTCGGCAGGTTTTTG roLeuAlaLysLeuGlyAsnThrArgAlaAlaValAsnProAspThrAlaThrValAspL 212 euAsnvalvalvalAspSerGlyArgProIleAlaPheGlyAspPheGluIleThrGlyT 232 hrGlnArgTyrProGluGlnIleValSerGlyLeuAlaArgPheGlnProGlyThrProT 252 yrAspLeuAspLeuLeuLeuAspPheGlnGlnAlaLeuGluGlnAsnGlyHisTyrSerG 272 -----AlaAlaGlyIleSerGlnProArgAsnTyrArgGlyAsnT 358 ----ThrSerAsnValSerTyrAsnArgSerThrThrGlnAsnL 373 euGluLysArgAlaPheSerGlyGlyIleTrpTyrValArgAspArgAlaGlyIleAspA 393 ------ArgLeuGlyAlaGluPheLeuA 401 laGluGlyArgLysIleProGlySerAspIleAspLeuGlyAsnSerHisAlaThrMetL 421 ٥---luAsnSerLysThrSerValLeuGlyAlaValThrArgLys------GlyTyrP ACAACAAAACCCGCGACGAAGTCGTGCGCCGCGAATTGCGCCAAATGGAATCCGCGCCTT --AAGTCGGCCGCCCTGCGCGCCTCACGAAGCAAAACCACGCTCAACGGCTCGCTGTCGT CCTTCGACCCGCGCAAAGCATCGACCAGCATCAAACAATATAAAACCACCACGGCAGGCG luTyrGlyLeuGlyGlyLysIleAlaTyrAspTyrTyrAsnLeuPheAsnLysGlyTyrI 330 leGlySerValValTrpAspMetAspLysTyrGluThrThrLeu------eu-----ThralaSerTrpLysArgGlnLeuLeuAsnAsnValLeuHisProGluAsnG eulleargThrSeralaArgAlaGlyTyrPhePheThrProGluAsnLys----CCATGAAGCCCGGCAAATGGTACGAA-GC---TACCTGACGGGC------358 yrTrp-----393 la-----1598 232 1070 1130 1360 1418 1478 1538 1709 439 953 212 252 310 345 373 401 1769 476 421 a g q a qq g q ò q ò g q g 염 ò рp ò qq ò g q g ò ò ò ò ò ò ò ò à ò ò ò ò

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1916 ACGCAGAACCAAAGAAATCCCCTTCTTGAAAACTTCTACGGCGGCGCGCTGGTTCGG 1975
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/product= "Mature N. meningitidis serogroup B antigen"
                                                                         1976 TGCGCGGATACGAAAGCGGCACGCTCGGTCCGAAAGTGTATGACGAATACGGCGAAAAA 2035
                                                                                                                                                                                         2141 CAGGCAGCGTGTGGGACGGCAAAACCTACGACGACAGCAGCAGTTCCGCGACCGGCGGCGCA 2200
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                                                                                                                                  540 luTyrGlnLeuPro-----PheThrArgThrLeuSerGlyAlaValPheHisAspM 557
                                                                                                                                                                                                                                                             570 ysHisGlySerGlyLeuGlyValArgTrpPheSerProLeuAlaProPheSerPheAspI
                                                                                                                                                                                                                                                                                       590 lealaTyr-----GlyHisSerAspLysLysIleArgTrpHisIleSerLeuG
                                                                                             521 --LeuAlaGlyProAsnGlySerValLeuProGluArgAlaLeuLeuValGlySerLeuG
                   rgAspAsnAla---AspValProSerGlyLeuMetPheArgSerGlyGlyAlaSerSerV
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          meningitidis serogroup B antigen"
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                                                                                                                                                                                                           -----AlaAlaAlaAsnPheLysArgMet
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1..2394
                                                      511 alArgGlyTyrGluLeuAspSerIleGly-
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The sequence represents a DNA encoding a Neisseria meningitidis serogroup B 85 kpa antigenic protein. Neisseria meningitidis colonises the pharynx, causing meningitis and, occasionally, septicaemia in the absence of meningitis. This antigenic protein is useful in the manufacture of a medicament for treating or preventing infection due to Neisseria bacteria, such as meningitis and septicaemia. It is also useful as a diagnostic reagent for detecting the presence of Neisseria bacteria or antibodies raised against Neisseria, and as a reagent for raising the antibodies. The Neisserial nucleotide sequences can be expressed in a variety of different expression systems, for example, mammalian cells, baculoviruses, plants, bacteria and yeast.
                                                                                                                                                                                                                               Novel 85 kDa antigen from Neisseria meningitidis and Neisseria
gonorrhoeae, useful in the manufacture of a medicament for treating and
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      ::::::|||
1087 GAGTCGTCGCCGTGAATTACGCCAAATGGAATCCGCACCTTACGACACCTCCAAGCTG 1146
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(STAT-) STATENS INST FOLKEHELSE
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1147 CAACGTTCCAAAGAGGGGGGTGGAGCTTTTGGGCTACTTCGAC-----AATGTCCAGTTT 1200
                                                                                             1555 GTGCCTGTTACCGAATACGACCGCGTGAATTTCGGTTTGGTGGCAGAACACCTGACCGTC 1614
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258 LeuaspPheGlnGlnAlaLeuGluGlnAsnGlyHisTyrSerGlyAlaSerValGlnAla
                                                                     278 AspPheAspArgLeuGlnGly-----AspArgValProValLysValSerValThrGlu
                                                                                                                                                                                  316 LyslleAlaTyrAspTyrTyrAsnLeuPheAsnLysGlyTyrIleGlySerValValTrp
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Composition for treating or preventing infection to, detecting, or for raising antibodies against Neisserial bacteria, comprises an N. meningitidis serogroup B outer membrane preparation and an immunogenic
                                                                            2278 GCGGTTACCTGGCTTTAGGCCCGATGAAATTCAGCTACGCCTACGCTGAAG 2337
2158 GGCAAAACCTACGACGACAACAGCAGTTCCGCGACCGGCGGCAGGGTTCAAAACATTTAC 2217
                                                                                                                                                                                                                                                                  Serogroup B protein; outer membrane protein; Neisserial infection; vaccine; ss.
                                         2218 GGGGCGGCAATACCCATAAATCCACCTTTACCAACGAATTGCGCTATTCCGCCGGCGGC
                      -- LysLeuLysHisGlySerGlyLeu
                                                               576 GlyValArgTrpPheSerProLeuAlaProPheSerPheAspIleAlaTyr-----
                                                                                                                       2338 AAAAAACGGAAGAAGACGAAACCCAACTCCAACTCGGCACGGACGTC 2391
                                                                                                          ---GlyHisSerAspLysLysIleArgTrpHisIleSerLeuGlyThrArgPhe
                                                                                                                                                                                                                                                                                                                                                          "Neisseria serogroup B protein"
                                                                                                                                                                                                                                            Nucleotide sequence of a Neisserla serogroup B protein.
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                    560 AlaAlaAlaAsnPheLysArgMet--
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The present sequence encodes a Neisserla serogroup B protein. The protein is used to produce the compositions of the invention. The specification describes a composition, comprising a Neisserla meningitidis serogroup B outer membrane preparation and an immunogenic component. The immunogenic component is protein disclosed in W099/57280, W099/36544, W099/58681, W099/58731, W099/28273, W099/291132, W099/58683, W099/58873, and/or N. meningitidis protein Pork, TbpA, TbpB, PilC, OpA, or Omp85. The composition is used for making a medicament for treating or preventing infection due to Neisserial bacteria; a diagnostic reagent for detecting the presence of Neisserial bacteria or of antibodies raised against Neisserial bacteria; and/or

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1435 ACGGCAGACGGGGTCAGCCTGGGCTACGATGTTTACGGAAAAGCCTTCGACCCGCGCAAA 1494
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            GlnIleValSerGlyLeuAlaArgPheGlnProGlyThrProTyrAspLeuAspLeuLeu 257
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 AspPheAspArgLeuGlnGly-----AspArgValProValLysValSerValThrGlu 295
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        ValLysArgHisLysLeuGluThrGlyIleArgLeuAspSerGluTyrGlyLeuGlyGly 315
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TGGTACGAA------CGCCAGCAGATGACCGC 909
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                                                                                                                                                                                                                                                  ProArgThrLysIleAlaAsnValGlyValAlaIleLeuGlyAspIleLeuSerAspGly 149
                                                                                                                                                                                                                                                                                                         ::: 111 ::: cacaccaagecccaaagecgaaatagaaactgctgaccatgaageccggcaaa 882
                                                                                                                                                                                                                                                                                                                                    TrpGlnGlnProValGlySerAspPheAspGlnAspSerTrpGluAsnSerLysThrSer 181
                                                                                                                                                                                                                                                                                                                                                                              ValLeuGlyAlaValThrArgLys------GlyTyrProLeuAlaLysLeuGly 197
                                                                                                                                                                                   GAAAAAGTAACCGACTTCTACCAAAATAACGGCTACTTCGATTTCCGTATCCTCGATACC 726
                                                                                                                                                                                                                           GACATCCAAACCAACGAAGACAAAACCAAGCAGACCATCAAAATCACGTCCACGAAGGC 786
                                                                                                                                                                                                                                                                                           a reagent which can raise antibodies against Neisserial bacteria. It also be used as a vaccine.
                                                                                                                                                                                                                                                                     787 GGACGTTTCCGTTGGGGCAAAGTCTCCATC-----GAAGGC
                                                                                                                                                                                                       LysValSerLeuThrGluLysAspGlyAlaTyrThrValHisIleThr-----ProGly
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         345 --- AlaAlaGlyIleSerGlnProArgAsnTyrArgGlyAsnTyrTrp--
                              Sequence 2394 BP; 657 A; 743 C; 583 G; 411 T; 0 other
                                                              Length:
Matches:
Conservative:
Mismatches:
Indels:
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                                                              1.54e-13
253.00
36.25%
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Best Local Similarity:
Query Match:
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2337 -----GTGAACGCCGAAATCGCCTGCCTGCAGC 1812 GIGCCTGTTACCGAATACGACCGCGTGAATTTCGGTTTGGTGGCAAAACACCTGACCGTC 1614 1993 GGCACGCTCGGTCCGAAAGTCTATGACGAATACGGCGAAAAAATCAGCTACGGCGGCAAC 2052 560 AlaAlaAlaAsnPheLysArgMet------LysLeuLysHisGlySerGlyLeu 575 GlyThrPheIleIleArgGlyGlnAlaGlyTyrThrValAlaArgAspAsnAla---Asp 496 LyslleGlyThrThrLeuGlyThrPheLeuSerSerThrAlaLeuIleArgThrSerAla 464 465 ArgAlaGlyTyrPhePheThrProGluAsnLys------LysLeu 477 GlySerValLeuProGluArgAlaLeuLeuValGlySerLeuGluTyrGlnLeuPro--- 544 407 ProGlySerAspIleAspLeuGlyAsnSerHisAlaThrMetLeu-----ThrAlaSer 424 GGCAAAACCTACGACGACAACAGCAGTTCCGCGACCGGCGGCAGGGTTCAAAACATTTAC 2278 GCGGTTACCTGGCTCTCGCCTTTAGGCCCGATGAAATTCAGCTACGCCTACCGGTGAAG GACGGCACAGAC------GGCAGCTTCAAAGGCTGGCTGTACAAAGGTACCGCGC -----ArgLeuGlyAlaGluPheLeuAlaGluGlyArgLysIle-reuAlaGlyProAsn -----PheThrArgThrLeuSerGlyAlaValPheHisAspMetGlyAsp-----GlyValArgTrpPheSerProLeuAlaProPheSerPheAspIleAlaTyr--------ThrSerAsnValSerTyrAsnArgSerThrThrGlnAsnLeuGluLysArgAlaPhe 2338 AAAAAACCGGAAGACGAAATCCAACGCTTCCAATTCCAACTCGGCACGTTC 2391 ---GlyHisSerAspLysLysIleArgTrpHisIleSerLeuGlyThrArgPhe 609 SerGlyGlyIleTrpTyrValArgAspArgAlaGlyIleAspAla---

GACATCCAAACCAACGAAGACAAAACCAAGCAGACCATCAAAATCACCGTCCACGAAGGC 48083

LysValSerLeuThrGluLysAspGlyAlaTyrThrValHisIleThr-----ProGly 129

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ProArgThrLysIleAlaAsnValGlyValAlaIleLeuGlyAspIleLeuSerAspGly 149

GACACCAACGAAGTCCCCAAAGCCGAACTGGAAAAACTGCTGACCATGAAGCCCGGCAAA 48179

TrpGlnGlnProValGlySerAspPheAspGlnAspSerTrpGluAsnSerLysThrSer 181

TGGTACGAA----

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ValLeuGlyAlaValThrArgLys------GlyTyrProLeuAlaLysLeuGly 197

48264 AGCGTACCGCTGCCGAACGCTGAAACCGACGTCGATTTCGTCCTGCACATGGAA 48323

AsnThrArgAlaAlaValAsnProAspThrAlaThrValAspLeuAsnValValAsp

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SerGlyArgProlleAlaPheGlyAspPheGlulleThrGlyThrGlnArgTyrProGlu 237

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The present invention describes methods of obtaining immunogenic proteins from Neisseria genomic sequences. AAA81453 to AAA82144

crepresent specifically claimed Neisseria meningitidis genomic DNA sequences; AAA81260 to AAA81303 and AAA81304 to AAA81312 represent PCR primers used in the AAA8136 and AAA81312 represent PCR primers used in the isolation of Neisseria meningitidis DNA sequences; and AAA81324 to AAA81452 represent Neisseria meningitidis MenB polynucleotide ORF sequences, which are all used in the exemplification of the present invention. The nucleic acid sequences, protein sequences, and antibodies against them, can be used in the manufacture of a composition or the nucleic acid sequences, protein sequences, and antibodies against them, can be used in the manufacture of a composition of the recent invention. The medicament) for treating, preventing or diagnosing infection due to Neisserial bacteria. For example, some of the identified proteins could confuse the bacterium will also facilitate production of sequences from the bacterium will also facilitate production of sequences from the bacterium will also facilitate production of biological probes, multivalent vaccines have also been tried but none have successfully overcome antigenic variability. The provision of further, complete sequences may provide an operating the presumed targets for the immune system and which are not antigenically variable or at least more conserved than
                                                                                                                                                                                                                                                                                                                                                                                                            Tettelin H, Venter JC;
Ratti G, Scarselli M, Scarlato V;
                                                         Neisseria meningitidis; Neisseria gonorrheae; genome; immunogenic; antigen; vaccine; dlagnosis; infection; antibacterial; identification;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Isolated nucleotide sequences of Neisserla meningitidis which can be used in the diagnosis and treatment of N. meningitidis infection and other Neisserlal infections, for example, N.gonorrhoea -
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                     partial DNA sequence gnm_26 SEQ ID NO:26.
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Rappuoli R, Pizza M;
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99US-0132068
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                                                                                               Meningococcus B; MenB; ds
                                                                                                                                          Neisserla meningitidis
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                   meningitidis
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48324 CCGGCCGGAAAATCTACGTCAACGAAATACACATCACGGCAACAAAAACCCGCGAC 48383
                                                                                   GAAGTCGTCGCCGTGAATTACGCCAAATGGAATCCGCACCTTACGACACCTCCAAGCTG 48443
                                                                                                                                                            CAACGTTCCAAAGAGCGCGTCGAGCTTTTGGGCTACTTCGAC-----AATGTCCAGTT 48497
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| 48972 GACGGCACAGAG-------GGCAGCTTCAAAGGCTGGCTGGTGTACAAAGGTACCGTCGGC 49022
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                                                      Gln11eValSerGlyLeuAlaArgPheGlnProGlyThrProTyrAspLeuAspLeuLeu 257
                                                                                                                                   LeuAspPheGlnGlnAlaLeuGluGlnAsnGlyHisTyrSerGlyAlaSerValGlnAla 277
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Mismatches:
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Matches:
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47964 GAAAAAGTAACCGACTTCTACCAAAATAACGGCTACTTCGATTTCCGTATCCTCGATACC 48023

Indels:

1.04e-11 253.00 36.25% 21.68%

Percent Similarity: Best Local Similarity:

Duery Match:

Alignment Scores:

US-09-857-669-2 (1-609) x AAA81478 (1-52253)

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49023 TGGGGGCGCAACAAAACCGACAGGGGGTTATGGCCGACGCGCGGC---TACCTGACGGGC 49079
                                                                                             ----GTGAACGCCGAAATCGCCCTGCCTGGCAGC 49109
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                                                                                                                                                                      49110 AAACTGCAATACTACTCCGCCACCCACAACCAAACCTGGTTCTTCCCCCTGAGCAAAACC 49169
                                                                                                                                                                                                                                                                                                                                                                                                                                                  ------AAAAAAGCCAACGTCTCCGCCGAGCTCTTCCCGATGCCCGGTGC
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                                                                                                                                                                                                                                                                        ValProSerGlyLeuMetPheArgSerGlyGlyAlaSerSerValArgGlyTyrGluLeu 516 :::!|}
425 TrpLysArgGlnLeuLeuAsnAsnValLeuHisProGluAsnGlyHisTyrLeuAspGly 444
                                                                  445 LyslleGlyThrThrLeuGlyThrPheLeuSerSerThrAlaLeuIleArgThrSerAla 464
                                                                                                                                                                                                        GlyThrPheIleIleArgGlyGlnAlaGlyTyrThrValAlaArgAspAsnAla---Asp 496
                                                                                                                                                                                                                                                                                                                                              AspSerIleGly-----LeuAlaGlyProAsn 525
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         526 GlySerValLeuProGluArgAlaLeuLeuValGlySerLeuGluTyrGlnLeuPro---
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                                                                                                                                      465 ArgAlaGlyTyrPhePheThrProGluAsnLys--
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28-FEB-2000; 2000GB-0004695.
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Neisseria meningitidis B (NMB). The sequences in AAP21544 and AAP21607 to AAP21613 represent fragments of the NMB genomic sequence, as the sequence was too long to go in a record on its own it was split into B sequences which overlap each other at the beginning and end of each sequences which overlap each other at the beginning and end of each sequences by 49980 bp (i.e. the last 49980 bp of AAP2164 is repeated at the beginning of AAP21660, the last 49980 bp of AAP21607 are repeated at the beginning of AAP21660, the last 49980 bp of AAP21689 encode the Neisseria proteins given in AAB58550 to AAB58593, and AAP2189 to AAP21606 represent PCR primers which are used in the exemplification of the present invention. The NMB genome and fragments from it have antibacterial activity, and can be used in vaccines and gene therapy.

Neisseria nucleic acids, proteins and/or antibodies which binds to the proteins can be used in compositions for treating or preventing the presence of Neisserial bacteria or as a diagnostic reagent for detecting the presence of Neisserial bacteria or as a diagnostic reagent for detecting the presence of Neisserial bacteria or as a diagnostic reagent for detecting the concernate accomputers, computers, computer memory, computer storage medium or computer catcher accomputer secrets of antibodies arised to Neisserial bacteria or of antibodies arised to Neisserial bacteria or of antibodies proteins provide further opportunities to film antigenic or immunogenic proteins which are more effective in vaccines than the outer membrane proteins currently
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      ------CGCCAGCAGATGACCGCC 179898
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Db 180080 GACATCCAAACCAACGAAGACAAAACCAAGCAGACCATCAAAATCACCGTCCACGAAGGC 180021
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Db 179984 GACACCAACGAAGTCCCCAAAGCCGAACTGGAAAAACTGCTGACCATGAAGCCCGGCAAA 179925
                                                                                                   Masignani V;
Rappuoli R;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   130 ProArgThrLysIleAlaAsnValGlyValAlaIleLeuGlyAspIleLeuSerAspGly 149
                                                                                                                                                                                                                                                             Neisseria meningitidis B full length genome sequence and open reading frames are used to detect, treat and prevent Neisserial infections - \,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          ---SerSer 111
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            150 AsnLeuAlaGluTyrTyrArgAsnAlaLeuGlu----------Asn 161
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Db 180140 GAAAAAGTAACCGACTTCTACCAAAATAACGGCTACTTCGATTTCCGTATCCTCGATACC
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             112 LysValSerLeuThrGluLysAspGlyAlaTyrThrValHisIleThr----ProGly
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     TrpGlnGlnProValGlySerAspPheAspGlnAspSerTrpGluAsnSerLysThrSer
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Sequence 349980 BP; 83241 A; 85091 C; 95206 G; 86442 T; 0 other;
                                                                                                      Peterson J, Tettelin H, Venter JC,
Ratti G, Scarselli M, Scarlato V,
                                                                                                                                                                                                                                                                                                                                                                                               The present invention describes the full length genome of
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Length:
Matches:
Conservative:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       97 AspásnValLysThrMetLeuArgSerLysGlyTyrPhe----
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Mismatches:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Db 180020 GGACGTTTCCGTTGGGGCAAAGTCTCCATC-----
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Gaps:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     US-09-857-669-2 (1-609) x AAF21544 (1-349980)
                                                                                                                                                                                                                                                                                                                                          Claim 7; Appendix A; 692pp; English.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          1,4e-10
253.00
36,25%
21,68%
7.97%
                      (CHIR ) CHIRON CORP. (GENO-) INST GENOMIC RES.
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                                                                                                                            C, Mora M,
M, Grandi G;
                                                                                                      Pizza M, Hickey E,
                                                                                                                                                                                                            WPI; 2000-647603/62.
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Alignment Scores:
                                                                                                                                                          Frazer CM,
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DB:
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Db 179897 GTTTTGGGTGAGATTCAGAACCGCATGGCTTCGGCAGGTACGCATACAGCGAAATC--- 179841

ValLeuGlyAlaValThrArgLys------GlyTyrProLeuAlaLysLeuGly 197

182

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à	198		
g	179840	AGCGTACAGCCGCTGCCGAACGCTGAAACCGAAACGCGTGGATTTCGTCCTGCACATCGAA 179781	
સ્તુ	218 179780	SerGlyargProllealaPheGlyAspPheGluleThrGlyThrGlnargTyrProGlu 237	
₹ 8	238 179720	GINITEVALSerGlyLeualaargPheGlnProGlyThrProTyraspLeuAspLeuLeu 257 	
⋩	258		
g	179660		
≿	278	AspPheAspArgLeuGlnGlyAspArgValProValLysValSerValThrGlu 295	
g	179606		
≿	296	ValLysArgHisLysLeuGluThrGlyIleArgLeuAspSerGluTyrGlyLeuGlyGly 315	
ą	179546	CGTTCCACCGG	
⋩	316	LysilealaTyraspTyrTyrasnLeuPheAsnLysGlyTyrIleGlyserValValTrp 335	
ą	179486		
⋩	336	AspMetAspLysTyrGluThrThrLeu344	
ą	179432		
≿	345	AlaalaGlyIleSerGlnProArgAsnTyrArgGlyAsnTyrTrp 359	
ð	179372		
⋩	360	ThrSerAsnValSerTyrAsnArgSerThrThrGlnAsnLeuGluLysArgAlaPhe 378	
ည	179312		
⋩	379	SerGlyGlyIleTrpTyrValArgAspArgAlaGlyIleAspAla 393	
ð	179252	G	
⋩	394	ArgLeuGlyAlaGluPheLeuAlaGluGlyArgLysIle 406	
æ	179192	AACACCTACAACAAAGCGCC	
⋩	407	ProGlySerAspleAspLeuGlyAsnSerHisAlaThrMetLeu	
Q	179132	GACGGCACAGACGCCACCTTCAAAGGCTGGCTGTACAAAGGTACCGTCGGC 179082	
≿	425	TrpLysArgGlnLeuLeuAsnAsnAsnValLeuHisProGluAsnGlyHisTyrLeuAspGly 444	
ð	179081		
≿	445	rThrAlaLeuIleArgThrSerAl	
ð	179024	GTGAACGCCGGAAATCGCCCTGCCTGCGGCGC 178995	
≿	465	ArgAlaGlyTyrPhePheThrProGluAsnLys	
g	178994	AAACTGCAATACTGCGCCACCCACCAACCAGGTTCTTCCCCCTGAGCAAACC 178935	
≿	4	GlyThrPheIlGlleArgGlyGlnAlaGlyTyrThrValAlaArgAspAsnAlaAsp 496	
ð	178934	TTCACGCTGATGCTCGGCGGGGGAGTCGGCATTGCGGGGGGCGCTACGGCAACAAGAA 178875	
≿	497	ValProSerGlyLeuMetPheArgSerGlyGlyAlaSerSerValArgGlyTyrGluLeu 516 :::	
ĕ	b 178874	ATCCCCTTCTTTGAAAACTTCTACGGCGGCGGCCTGGGTTCGGTGCGCGCGAAAGC 178815	

ò	517	AspSerIleGly
q	178814	CCGAAAGTCTATGACGAATACGGCGAAAAAT
ΟŸ	526	GlySerValLeuProGluArgAlaLeuLeuValGlySerLeuGluTyrGlnLeuPro 544
G	178754	
οy	545	PheThrArgThrLeuSerGlyAlaValPheHisAspMetGlyAsp 559
Op	178709	GCGAAAGACGCGCGCCCTCGCCCTGAGCCTTTTGCCGACGCAGGCAG
oy	559	659
qq	178649	GGCAAAACCTACGACGACAACAGCAGTTCCGCGACCGGCGGCAGGTTCAAAACATTTAC 178590
οy		575
DP	178589	GGCGCCGGCAATACCCATAAATCCACCTTTACCAACGAATTGCGCTATTCCGCCGGCGGC 178530
oy do	576 178529	GlyValargTrpPheSarProLeuAlaProPheSerPheAsp1leAlaTyr 592
S S	Oy 593 Db 178469	GlyHisSerAspLysLysIleArgTrpHisIleSerLeuGlyThrArgPhe 609
RE: AA/ ID	RESULT 21 AAA15156 ID AAA15156	.156 standard; DNA; 2394 BP.
¥ X	AAA15156;	156;
×		21-AUG-2000 (first entry)
X E X		DNA encoding outer membrane protein (omp) 85.
333		Outer membrane protein; omp85; gonococcal infection; symptomatic disease; meningococcal infection; protective immune response; vaccine; ss.
000	Neis	seria meningitidis.
H L L L L	Key CDS	Location/Qualifiers 12394 /*tag= a /product= "outer membrane protein 85"
Y Z	-	WO200023595-A1.
263		27-APR-2000.
7 H S	22-0CT	T-1998; 98WO-US22352.
P. X.	22-0CT	T-1998; 98WO-US22352.
ζ <u>Α</u> λ		(UYMO-) UNIV MONTANA.
Y I S	Judd	RC, Manning SD;
, H H	3≥ 0₁	PI; 2000-339694/29. -PSDB; AAY84947.
ET T T	New i menin compo	New isolated outer membrane protein 85 of Neisseria gonorrhoeae and N. meningitidis useful for vaccine, therapeutic and diagnostic compositions for gonococcal or meningococcal infections
PS X	_	Claim 46; Page 85-89; 98pp; English.
888		The present sequence encodes an outer membrane protein (omp) 85 of Neisseria meningitidis. The omp polypeptides and polynucleotides are useful in compositions for use in the prevention, treatment and diagnosis
ပ္ပ		n-symptomatic gonococcal infection or meningococcal infection and

hybridisation complexes. Antigens and antibodies specific omp proteins also provide diagnostic, therapeutic and prophylactic compositions for the treatment or prevention of the infections described above. The antibodies are useful for inducing a protective immune response in humans or animals with N. gonorrhoeae, N. meningitidis, or other Neisseria species. The proteins, antibodies and polynucleotide sequences of the present invention may also be used in the screening and development of chemical compounds such as drugs or vaccines. symptomatic disease. They are also useful for the detection of

1130 ACGACACCTCCAAGCTGCAACGCTCCAAAGAGCGCGTCGAGCTTTTGGGCTACTTCGAC- 1188 252 272 192 roLeuAlaLysLeuGlyAsnThrArgAlaAlaValAsnProAspThrAlaThrValAspL 212 212 euAsnValValValAspSerGlyArgProlleAlaPheGlyAspPheGluIleThrGlyT 232 uGluAlaProAspAsnValLySThr ---- - MetLeu-ArgSerLysGlyTyrPhe---- 109 ------SerSerLysValSerLeuThrGluLysAspGlyAlaTyrThrValHisI 126 710 TCCGTATCCTCGATACCGACATCCAAACCAACGAAAACCAAGCAGCAGCATCAAAA 769 -----GAAGGCGACACCAACGAAGTCCCCAAAGCCGAACTGGAAAACTGCTGA 865 ------AsnTrpGlnGlnProValGlySerAspPheAspGlnAspSerTrpG 176 176 luAsnSerLysThrSerValLeuGlyAlaValThrArgLys------GlyTyrP 192 leThr-----ProGlyProArgThrLysIleAlaAsnValGlyValAlaIleLeuGlyA 144 --ProLysPhe 53 73 oLeulleThrGlnGlnGlnGluGluValLeuAspLysGluGlnThrGlyPheLeuAlaGl 93 ProVal-ArglleAspThrGlnAspSerGluIleLysAspMetValGluGluHisLeuPr 73 530 CCGACATCGAATTTGAAGGCAACCAAGTCTATTCCGACCGCAAACTGATGCGGCAGATGT 893 GCCAGCAGATGACGCCGTTTTGGGTGAGATTCAGAACCGCATGGGCTCGGCAGGTACC 953 CATACAGCGAAATC---AGCGTACAGCCGCTGCCAAACGCGGAAACCGTCGATT 590 CGCTGACCGAAGGCGGCATTTGGACATGGCTGACACGAAGCAACCAATTCAACGAGCAGA 770 TCACCGTCCACGAAGGCGGACGTTTCCGTTGGGGCAAAGTCTCCATC------144 spileLeuSerAspGlyAsnLeuAlaGluTyrTyrArgAsnAlaLeuGlu------D-----232 hrGlnArgTyrProGluGlnIleValSerGlyLeuAlaArgPheGlnProGlyThrProT ACAACAAAACCCGCGACGAAGTCGTGCGCGCGAATTGCGCCAAATGGAATCCGCGCCTT yrAspLeuAspLeuLeuLeuLeuAspPheGlnGlnAlaLeuGluGlnAsnGlyHisTyrSerG Sequence 2394 BP; 656 A; 752 C; 587 G; 399 T; 0 other; Length:
Matches:
Conservative:
Mismatches:
Indels: US-09-857-669-2 (1-609) x AAA15156 (1-2394) SerProAspThrGluSerValLysLeuLys--CCATGAAGCCCGGCAAATGGTACGAA----2,13e-13 251,50 36,50% 22,04% 7,93% Percent Similarity: Best Local Similarity: Alignment Scores: Pred. No.: Query Match: DB: 1070 252 54 93 9 110 817 161 998 126 41 Score: 22222222223 222222222223 셤 g a ò 8 g ò g ò g ò g ŏ a ò g ŏ g õ ò ò g ò õ ò

Qy Db	272 lyalaSerValGlnAlaAspPheAspArgLeuGlnGlyAspArgValProValL 290 :::
Qy Db	290 ysvalservalThrGluValLysArgHisLysLeuGluThrGlyIleArgLeuAspSerG 310 ::: ::: :::
Qy	310 luTyrGlyLeuGlyGlyLysIleAlaTyrAspTyrTyrAsnLeuPheAsnLysGlyTyrI 330 ::
ر م	330 leGlySerValValTrpAspMetAspLysTyrGluThrThrLeu 344
δλ	45AlaAlaGlyIleSerGlnProArgAsnTyrArgGlyAsnT
qq	1418 TTACCGACCCGTACTTCACGGCAGACGGGGTCAGGCTAGGGTGTTTACGGAAAAG 1477
ογ	8 yrTrp
Op	1478 CCTTCGACCCGCGCAAAGCATCGACCAGCATCAAACAATATAAAACCACCACGGCAGGCG 1537
oy e	373 euGluLysArgAlaPheSerGlyGlyIleTrpTyrValArgAspArgAlaGlyIleAspA 393 1133 CAGGCAPTCGLAGGGGGGGGGGGGGAATAGGGGGGAATTGGGGGGGGGG
λo	93 laArgLeuGlyAlaGluPheLeuA 4
qq	AACACCTACAACAAAGCGCCC
ογ	IleAspLeuGlyAsnSerHisAlaThrMe
QQ	GACGCACAGAC
δλ	421 euThrAlaSerTrpLysArgGlnLeuLeuAsnAsnValLeuHisProGluAsnG 439
qq	GGTACCGTCGGCTGGGGGCGCAACAAAACCC
οy	LysIleGlyThrThrLeuGlyThrPheLeu
q	- E-1
ον.	459 eulleArgThrSeralaArgAlaGlyTyrPhePheThrProGluAsnLys 475
qq	::
ΟŊ	476LysLeuGlyThrPheIleIleArgGlyGlnAlaGlyThrValAlaA 492
Dp	1856 TCCCCTTAAGCAAAACCTTCACGCTGATGCTCGGCGGCGAAGTCGGCGTTTGCGGGCGCT 1915
Óγ	492 rgAspAsnAlaAspValProSerGlyLeuMetPheArgSerGlyGlyAlaSerSerV 511
Ор	1916 ACGGCAGAACCAAAGAAATCCCCTTCTTGAAAACTTCTACGGCGGGCCTGGGTTCGG 1975
ογ	511 alArgGlyTyrGluLeuAspSerIleGly520
qo	1976 TGCGCGGATACGAAAGCGGCACGCTCGGAAAGTGTATGACGAAATACGGCGAAAAAA 2035
δy	521LeuAlaGlyProAsnGlySerValLeuProGluArgAlaLeuLeuValGlySerLeuG 540
qq	
ολ	540 luTyrGlnLeuProPheThrArgThrLeuSerGlyAlaValPheHisAspM 557
qq	909
ογ	557 etGlyAsp 559
QQ	2141 CAGGCAGCGTGTGGGACGGCAAAACCTACGACAACAGCAGTTCCGCGACCGGCGGCA 2200

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prevention
a coding
                                                                                                                                                                                                                                                                                                                                                 HtrA; PonA; HypC; YefW; ABCl; Ompl00; Lawsonia intracellularis infection;
vaccine; ds.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             coding
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           4703 TTAGCATTAACAGAACGTAATTTTTTATCATGGTTTACTGGAACAGGTGTATTACGTGAA 4762
                                                                    2321 ACGCCTACCCGCTGAAGAAAAACCGGAAGAGGAAATCCAACGCTTCCAATTCCAACTCG 2380
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             The present invention provides isolated polynucleotides encoding HtrA, PonA, Hypc, LysS, YefW, ABC1 or Omp100 protein of Lawsonia intracellularis. The sequences can be used in vaccines for the prevent of Lawsonia intracellularis infection. The present sequence is a codin sequence of the invention.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   GGGTTCAAAACATTTACGGCGCGGCAATACCCATAAATCCACCTTTACCAACGAATTGC 2260
--LysLeuL 570
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Ç
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     IleLysAspMetValGluGluHisLeuProLeuIle-----ThrGlnGlnGlnGlnGlu 80
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        --ThrGlyPheLeuAlaGlu 93
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Lawsonia intracellularis polynucleotide and encoded protein, used prevent Lawsonia intracellularis infection
                                                   570 ysHisGlySerGlyLeuGlyValArgTrpPheSerProLeuAlaProPheSerPheAspl
                                                                                                          590 leAlaTyr------GlyHisSerAspLysLysIleArgTrpHisIleSerLeuG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Sequence 6617 BP; 2216 A; 1153 C; 1142 G; 2106 T; 0 other;
                                                                                                                                                                                                                                                                                                                                Lawsonia intracellularis coding sequence SEQ ID NO: 1.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             6617
140
95
276
104
25
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Length:
Matches:
Conservative:
Mismatches:
Indels:
-----AlaAlaAlaAsnPheLysArgMet-
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Gaps:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         US-09-857-669-2 (1-609) x AAI97964 (1-6617)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Claim 3; Page 37-39; 67pp; Japanese.
                                                                                                                                                                                                                                                  BP
                                                                                                                                                                                                                                               AAI97964 standard; DNA; 6617
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          2.24e-12
247.00
38.21%
22.76%
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    20-OCT-2000; 2000JP-0320736.
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        GluValLeuAspLysGluGln--
                                                                                                                                                                                                                                                                                                      (first entry)
                                                                                                                                                                                                                                                                                                                                                                                                     Lawsonia intracellularis
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         (PFIZ ) PFIZER PROD INC.
                                                                                                                                                                                         2381 GCACGACGTTC 2391
                                                                                                                                                               lyThrArgPhe 609
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    WPI; 2001-592540/67
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Best Local Similarity:
                                                                                                                                                                                                                                                                                                                                                                                                                               JP2001169787-A
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                                                                                                                                                                                                                                                                                                      20-NOV-2001
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                                   4763 GAATATCTTGAACGTGACTCTATAGCAATCTCTGCCTATGCCATGAATCATGGCTATGTA 4822
                                                                                                               1823 GATATICAAGTIGCTICACCIGAAGTAACATICAATGAAAAAGGAATIGTTATTACATTT 4882
                                                                                                                                                                                         4919 ATAGACTTTAAAGGAGATCTTATTGAGACAAATGAACTACCTCTTAAAGTAAAAATT 4978
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         GATAATGTTATCCTCCGTGAATTACGCCTTGCTGATGGAGATCTTTTAATGGTCAACAT 5263
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         5372 CAAGAAGCTCGAACAGGTGCAATCACAGGTGGTGTTGGTTACTCAACACATTCTAAATTT 5431
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     GATGACTTCCGTAAAAAACTTATGGA---------GATACCATACGT 5644
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                                                                                                                                                                                                                                                                                                         -----GluAsnTrpGlnGlnProValGlySerAspPheAspGlnAspSerTrpGlu 176
                                                                                                                                                                                                                                                                                                                                                                                                                                                                 197 GlyAsnThrArgAlaAlaValAsnProAspThrAlaThrValAspLeuAsnValValVal 216
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         217 AspSerGlyArgProlleAlaPheGlyAspPheGluIleThrGlyThrGlnArgTyPro 236
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     352 ArgAsnTyrArgGlyAsnTyrTrpThrSerAsnValSerTyrAsn---ArgSerThrThr 370
 ----ValLysThrMetLeuArgSerLysGlyTyrPhe 109
                                                                                                                                                                                                                                                                                                                                                                                       AsnSerLysThrSerValLeuGlyAlaValThrArgLysGlyTyrProLeuAlaLysLeu 196
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     GluGlnIleValSerGlyLeuAlaArgPheGlnProGlyThrProTyrAspLeuAspLeu 256
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     294 ThrGluValLysArgHisLysLeuGluThrGlyIle-----ArgLeuAspSerGluTyr 311
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               GlyLeuGlyGlyLysIleAlaTyrAspTyrTyrAsnLeuPheAsnLysGlyTyrIleGly 331
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           SerValValTrpAspMetAspLysTyrGluThrThrLeuAlaAlaGlyIleSerGlnPro 351
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               371 GlnAsnLeuGluLysArgAlaPheSerGlyGlyIleTrpTyrValArgAspArgAlaGly 390
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   ------GlyAsnSer 416
                                                                         110 ------SerSerLysValSerLeuThrGluLysAspGlyAlaTyrThrVal
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       LeuLeuAspPheGlnGlnAlaLeuGluGlnAsnGlyHisTyrSerGlyAlaSerValGln
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                                                                                                                                                                                                                               IleLeuSerAspGlyAsnLeuAlaGluTyrTyrArgAsnAlaLeu-------
                                                                                                                                                                                                                                                                                                                                                                                                                           ------GCATTAACAGATTTTTATTCAGATTATGGTTATGCATTTTGCTGAAGTA
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GluAlaProAspAsn----
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5984 TATAAGAATAGTAAAAACCTGTGCCAGTATTTGACCGATTTTTATTGGTGGTATAGAT 6043
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                                                                                                                                       5879 -------GGTAATGATAACTTCTTCAAGCCAATTGCTGAACTACAAGGATTT 5923
                                                                                                                                                                                              5924 TACTCAATTTCAAGAAGTAAAAACCATATAATACATTGGCGTACACGTGCAGGTGCAGCT 5983
                           ServalArgGlyTyrGluLeuAspSerIleGlyLeuAlaGlyProAsn---GlySerVal 528
                                                                                                                                                                                                                                                                                                                                                                                                                                                        ------MetLysLeuLysHisGlySerGlyLeuGlyValArgTrpPheSerPro 582
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               -----HisSerAsp 596
417 HisalaThrMetLeuThrAlaSerTrpLysArgGlnLeuLeuAsnAsnValLeuHisPro 436
                                                       450 LeuGlyThrPheLeuSerSerThrAlaLeuIleArgThrSerAlaArgAlaGlyTyrPhe 469
                                                                                                                                                                   470 PheThrProGluAsnLysLysLeuGlyThrPheIleIleArgGlyGlnAlaGlyTyrThr 489
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Human; chromosome mapping; gene mapping; gene therapy; forensic; food supplement; medical imaging; diagnostic; genetic disorder; ss.
                                                                                                                                                                                                                         490 ValAlaArgAspAsnAlaAspValProSerGlyLeuMetPheArgSerGlyGlyAlaSer
                                                                                                                                                                                                                                                                                                                                        LeuProGluArgAlaLeuLeuValGlySerLeuGluTyrGlnLeuProPheThrArgThr
                                                                                                                                                                                                                                                                                                                                                                                               LeuSerGlyAlaVal----PheHisAspMetGlyAspAlaAlaAlaAsnPheLysArg
                                                                                 5825 TCTAAAGGGCATATTGCAAAACTAATTGTTGAATATGGAGGTGGTGGTCTTGGT----
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             6338 AAAAAACTCGTGGTAGATTTGAATTTTCAATGGGGCAATTCTTC 6382
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        DNA encoding novel human diagnostic protein #28893.
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              LeuAlaProPheSerPheAspileAlaTyrGly----
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23-AUG-2000; 2000US-0649167
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1578 CTGGGTATCGAAACCATGGGCGGTGTGATGACGACGCTGATCGCGAAAAACACCACTATC 1519

----AsnValLysThrMetLeuArgSerLysGlyTyrPhe---

1638 GGTGGTGTTCTGACTGGTGACGTAAAAGACGTACTGCTGCTGGACGTTACCCCGCTGTCT 1579

88 ThrGlyPheLeuAlaGluGluAlaProAsp------

1698 AAAGAGCCGCGTAAAGACGTTAACCCCGGACGAAGCTGTAGCAATCGGTGCTGCTGTTCAG 1639

85 LysGlu-------

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87

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1518 CCGACCAAGCACAGCCAGGTGTTCTTACCGCTGAAGACAACCAGTCTGCGGTAACCATC 1459

.....SerSerLysValSerLeuThrGluLysAsp....-GlyAlaTyrThrVal 124

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1458

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HisIleThrProGlyProArgThrLysIleAlaAsnValGlyValAlaIleLeuGlyAsp

145 IleLeuSerAspGlyAsnLeuAlaGluTyrTyrArgAsnAlaLeuGluAsnTrpGlnGln 164

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The invention relates to isolated polynucleotide (I) and probes, polypeptide (II) sequences. (I) is useful as hybridisation probes, polymerase chain reaction (PCR) primers, oligomers, and for chromosome and gene mapping, and in recombinant production of (II). The polynucleotides are also used in diagnostics as expressed sequence tags for identifying expressed genes. (I) is useful in gene therapy techniques to restore normal activity of (II) or to treat disease states involving to repressed genes. (I) is useful for generating antibodies against it, detecting or quantitating a polypeptide in tissue, as molecular weight markers and as a food supplement. (II) and its binding partners are useful in medical imaging of sites expressing (II). (I) and (II) are useful in medical clasorders involving aberrant protein expression or biological activity. The polypeptide and polynucleotide sequences have applications in capponalize for genetic disorders or other trails to assess biodiversity and to produce other types of data and products dependent on DNA and anino acid sequences. AAS6419-AAS94564 represent novel human DNA and
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             diagnostic coding sequences of the invention.

Note: The sequence data for this patent did not appear in the printed specification, but was obtained in electronic format directly from WIPO
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           1758 CTCGTTGGTGGTCAGACTCGTATGCCAATGGTTCAGAAAGTTGCTGAGTTCTTTGGT 1699
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         ---GluGluHisLeuProLeuIleThrGlnGlnGluGluValLeuAsp
                                         New isolated polynucleotide and encoded polypeptides, useful in diagnostics, forensics, gene mapping, identification of mutations responsible for genetic disorders or other traits and to assess
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Sequence 2193 BP; 481 A; 608 C; 582 G; 522 T; 0 other;
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146
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180
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Matches:
Conservative:
Mismatches:
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                                                                                                                                                      Claim 1; SEQ ID No 28893; 103pp; English.
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P-PSDB; ABG28902
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Ωp	1422	AACAAATCTCTGGTACACTGGCAC	1399
ογ	165 Pı	ProValG1ySerAspPheAspG1nAspSerTrpGluAsnSerLysThrSerValLeuGly	184
q	1399		1399
ογ	185 A	AlaValThrArgLysGlyTyrProLeuAlaLysLeuGlyAsnThrArgAlaAlaValAsn	204
QQ	1399		1399
٥ م	205 P1	ProAspThrAlaThrValAspLeuAsnValValValAspSerGlyArgProlleAla	223
3 8	200	CA1ACACCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCC	1304
3 8	. n	kneolyasprneolulielniciyinicinakgiyirrosluoluli lavalserolybeu 	243 1330
δγ	244 A]	AlaargPheclnProclyThrProTyrAspLeuAspLeuLeuLeuBeuAspPheclnGlnAla	263
g	1329 CC	CCTCACGCTGCACCAACGCCAACTAAC	1297
ογ	264 Le	LeuGluGlnAsnGlyH1sTyrSerGlyAlaSerValGlnAlaAspPheAspArgLeuGln	283
Op	1296 AC	ACCCCCAACAACTTCCACTGGGTGGCCGCA	1267
οy	284 G	GlyAspArgValProValLysValSerValThrGluValLysArgHisLysLeuGluThr	303
අ	1266 GC	GAGACGAAACCACCAGAACCAGGAACCGGCCT	1234
οy	304 G	GlylleArgLeuAspSerGluTyrGlyLeuGlyGlyLysIleAlaTyrAspTyrTyrAsn 	323
ор	1233 GC	GGACAGGACCAGAAATT	1216
ý	324 Le	LeuPheAsnLysGlyTyrIleGlySerValValTrpAspMetAspLysTyrGluThrThr	343
Op	1215	ATGAGGCGCATGATG	1195
οy	344 L6	LeuAlaAlaGlyIleSerGlnProArgAsnTyrArgGlyAsnTyrTrp	359
QQ	1194 CT	TICGCAAAGGGGATGTTGACGCCGTCCATACATGTTCGGGCCTTCCGAGAGAAC	1141
ογ	360 T	ThrSerAsnValSerTyrAsnArgSerThrThrGlnAsnLeuGlu	374
QC	1140	CAGAATCTCGTAGATCTGTACTAGATCT	1114
ογ	375 Ly	LysArgAlaPheSerGlyGlyIle-TrpTyrValArgAspArgAlaGlyIleAspAlaAr	394
q	1113 C	AGAAAGGTTTCCCTGGCTGTGTAAGCGTTCAGTGGCGGACCGGGCGTACCCCCGTGCCGA	1054
οy	394 gI	gLeuGlyAlaGluPheLeuAlaGluGlyArgLysIleProGlySerAspIleAs	412
QQ	1053 T	TTGTAATCCGGAGGCAGTTGGTTGGCACGGCCTGCGTTATCATCGACGCTGCT	1000
δy	412 pi	<pre>pLeuGlyAsnSerHisAlaThrMetLeuThrAlaSerTrpLysArgGlnLeuLeuAsnAs ::: </pre>	432
g	89 686	GATCACCTTCATCTGCATTTCAAAACGCCGCGCGCTGGC-AATCA	926
ò	432 nV	nValLeuHisProGluAsnGly	439
g	955 TC	TGTCGCTCATTGCCGAAACGGCATTGACGTTACTGCCTTCCAGAACCCCCGACATCACAC	968
ά	440	HisTyrLeuAspGl	444
QQ	895 GC	GCAAGGCGGCTGGCAGCGTGCCATTAACCTGCGCTGGAGTCTCGACCACTTTACTCAGG	836
٥y	444 yI	yLysileGlyThrThrLeuGlyThrPheLeuSerSerThrAlaLeuIleArgThrSerAl	464
g	835 TC	TGAAATTACCAATACCACGATGCTGTTTTATCCTGGGGTGATGATTAGCCGCACGCGTTC	776
οy	464 aP	aArgalaGlyTyrPhe	469
QQ O	775 TC	TCGTGGTGGCCTGATGCCAACCTGGGGCGACTCGCAACGCTACTCTATCGACTACTCCAA	716

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New nucleotide molecule encoding a surface exposed protein and is incorporated and expressed in Methylococcus capsulatus, useful in manufacturing vaccines that can be administered orally in animals, fish
                                                                                                                                                                        -- PheThrProGluAsnLysLysLeuGl 478
                      715 CACGGCCTGGGGTTCAGATGTCGATTTCTCCGTTTTCCAGGCGCAGAACGTCTGGATCCG 656
                                                   492
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                                                                                                                                                                                                                                                                                                               572 ySerGlyLeuGlyValArgTrp-PheSerProLeuAlaProPheSerPheAspIleAlaT 592
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Methylococcus capsulatus surface protein-antigen D15 DNA SEQ ID NO:5
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Methylococcus capsulatus; methanotropic bacterium; MopC; MopD; MopE; MopF; D15; surface protein antigen; helper protein; vaccine;
                                                   478 yThr --------PhellelleArgGlyGlnAlaGlyTyrThrValAlaAr
                                                                   492 gAspAsnAlaAspValProSerGlyLeuMetPheArgSerGlyGlyAlaSerSerValAr
                                                                                                                                                        gGlyTyrGluLeuAspSerIleGlyLeuAlaGlyProAsnGlySerValLeuProGluAr
                                                                                                                                                                                                                                                                           595 TGATTTCGACAAAGTACCGCCGGATCTGCGTTTCTTCGCCGGGGGCGACCGCAGTATTCG
                                                                                                                                                                                                                                                             552 aValPheHisAspMetGlyAspAlaAlaAlaAsnPheLysArgMetLysLeuLysHisGl
                                                                                                                                                                                                                                                                                                                                                                                 295 TACCGGTCGCGGATAAAGACGAACACGGGTTACAGTTTTACATCGGTCTGGGG 243
                                                                                                                                                                                                                                                                                                                                                                 592 yrGlyHisSerAspLysLys-----IleArgTrpHisIleSerLeuGly 606
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        , Jonassen I, Jensen HB, Lien T;
Eisen JA, Fraser CM, Durkin AS;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 (UNIF-) UNIFOB STIFTELSEN UNIV BERGEN. (TIGR-) TIGR.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Claim 1; Page 34-35; 39pp; English
                                                                                                                                                                                                                                                                                                                                                                                                                                            ABQ72980 standard; DNA; 2388 BP.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Birkeland NK, Eidhammer I,
Lillehaug JR, Lossius I, Ei
Salzberg SL;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               14-JAN-2002; 2002WO-NO00018.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         12-JAN-2001; 2001NO-0000238.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             20-SEP-2002 (first entry)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          epitope mapping; gene; ds.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Methylococcus capsulatus.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          WPI; 2002-557813/59.
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ABQ72980
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The present invention describes a nucleotide molecule (I) comprising a sequence that codes for any of the 14 Methylococcus capsulatus conclotide sequences given in ABO/2976 to ABO/2889. Also described is a method for producing a desired protein in a heaterial host cell, comprising a first nucleotide sequence selected from the group of 14 Methylococcus capsulatus, and comprising a nucleotide sequence selected from the group of 14 Methylococcus capsulatus, and comprising a nucleotide encoding the desired protein linked in frame to the first nucleotide conditions that allow the expression of the protein. (I) can be used in vaccine production. The nucleic acids or the protein. (I) can be used in vaccine production. The nucleic acids or the proteins from the present invention can be used in manufacturing vaccines that can be administered in animals, fish or humans. The method is useful in producing fusion proteins carrying foreign peptide sequences that can also be useful in epitope mapping, screening of antibody libraries and as immunogens. The present sequence represents the specifically claimed Methylococcus capsulatus surface protein-antigen D15 nucleotide sequence.

Sequence 2388 BP; 535 A; 653 C; 686 G; 514 T; 0 other;

	2388	151	66	259	249	29
						Gaps:
	8.1e-12					
Alignment Scores:	Pred. No.:	Score:	Percent Similarity:	Best Local Similarity:	Query Match:	DB:

Length: 2388 Matches: 151 Conservative: 99 Mismatches: 259 Indels: 249 Gaps: 29	Tyralaproalaalaasp 34	AlaLeuPheLysAsnLysSerProAspThrGluSerValLysLeuLysProLysPhePro 54	ValargileaspthrGinaspSerGluIleLysAspMetValGluGluHisLeuProLeu 74	IleThrGlnGlnGln	GluGlnThrGlyPheLeuAlaGluGluAlaProAspAsnVal 99 :::	LysThrMetLeuArgSerLysGlyTyrPheSerSerLysValSerLeuThrGluLysAsp 119 ::: :::	GlyalaTyrThrValHisIleThrProGlyProArgThrLysIleAlaAsnValGly 138 AAAATCGATTCCCAGGTGACGGAACCGGGAACCGTGTGGCGGTGATCAAT 600	Valala		ArgAsnAlaLeuGluAsnTrpGlnGlnProValGlySerAspPheAspGlnAspSerTrp 175 :::: :::! ::::! :::::: ::: ACCAAGGATGTCGAGGGGG 771	GluAsnSerLysThrSerValLeuGlyAlaValThrArgLysGlyTyrProLeuAlaLys 195
8.1e-12 234.50 234.98% 19.92% 7.39% 24 x ABO72980 (1-2	AlaaspLeuse : : CGGGGGCGACACCCTCGA	iAsnLysSerProAspThrG1	oThrGlnAspSerGluIleLy 	Gln	GluGlnThrGlyPheLeuAlaGlu	LysThrMetLeuArgSerLysGlyTyrPheSerSerLysValSerLeuT ::: :: GAACAGGAACTGCGGCCCAGTATTACAGCCGGGGCAAATACAGCCTT-	GlyalaTyrThrValHisIleThrProGlyProArgThrLysIleAla- 	3CGCGTTGCTCGCATAAAACA	lleLe CTGACCCAGGATTTTGAGCT	JGluAsnTrpGlnGlnProVa ::: CAGTATTCCAAGCAGAATT	sThrSerValLeuGlyAlaVa :::
ores: larity: lmilarity 9-2 (1-60		AlaLeuPheLysAsnLys. 	Valargileas GTCCGTCTGGA(Valala ::: ATCGCGGAGGG			
Alignment Sc Pred. No.: Score: Percent Simi Best Local S Query Match: DB: US-09-857-66	20	35	319	75	436	100	120	139	145	721	176
Ali Pre- Sco Per Bes Que DB:	do Oy	\$ 6 6	6 6	6y Pb	Qy Dp	65 60 60	da da	Oy Dp	Oy Dp	oy B	ογ

Ωp	772 -	CTGCGCTCCTACTATCTCGCTGCGGGTTACGTCAATTTCGAA	~
0y	96	IyAsnThrArgAlaAlaValAsnProAspThrAlaThrValAspLeuAsnVa	215
οp	814 A		873
Qy	216 V	alAspSerGlyArgProlleAlaPheGlyAspPheGluIleThrGlyThrGlnArg	234
q	4		933
ογ	235 T	TyrProGluGlnIleValSerGlyLeuAlaArgPheGlnProGlyThrProTyrAspLeu	254
οgo	934 C	ACTCGTCCCGCTCGTGCGTATCGGGCCGGAGGATATTT	066
Οy	255 A	spLeuLeuLeuAspPheGlnGlnAla	263
qq	991 A	 agaaacccagaagggcatttccgatcgtttgggcgaggagg	1050
Οy	263 -		263
qa	1051 T	CAATATGGTGCCGGACATCAA	1110
οy	263 -		263
qq	1111 T	TTTTCGTCGATCCGGGCAAACAGGTCTACGTGAGGCGAATCAATTTCCAGGGCAATACC	1170
ò	263 -		263
qq	1171 A	SACGAAGTGCTG	1230
οy	264 -		273
qa	1231 A	ACCGCGAAGATCGAGCGTTCCAAGACCAGGCTCGAGGTCTCGGCTATTTCCAGGATGTC	1290
δy	74	SerValGlnAlaAspPheAspArgLeuGlnGlyAspArgValProValLysValSerVal	
qq	1291 A	GCCCGCGGTGCCGGGAACGACGGATCAGATCGACGTCAACTACAGTGT	1350
ογ	94	ThrGluValLysArgHisLysLeuGluThrGlyIlèArgLeuAspSerGluTyrGlyLeu	_
qq	1351 A	8	1410
ογ	314 G	GlyGlyLyslleAlaTyrAspTyrTyrAsnLeuPheAsnLysGlyTyrIleGlySerVal	333
Op	1411 A	ATATTCAATGCGGCGGTCACCCAGGACAACATTTCGGCAGCGGCAAGCGTGTCAGTTTC	1470
δy	334 V	alTrpAspMetAspLysTyrGluThrThrLeuAlaAlaGlyIleSerGlnPro	351
qq	71	Ä	1530
Οy	351 -		351
qq	1531 A	ACCGGCT/	1590
oy	352 A	rgAsnTyrArgG	360
q	1591 T	CGAACTATGTTGCCAACTACATTACCAA	1650
οy	361 -		367
qq	1651 C	CCATCGGAGAGTTCGACAGTATTCGGACCAACCTGGACTACAGTAACACCCAAGCTCAAG	1710
Qy	368 S	erThrThrGlnAsnLeuGluLysArgAlaPh	386
qq	11	CGACCTCCCAGTCTTCCGAT	1752
οy	387 A	spargalaGlyIleAspalaArgLeuGlyAlaGluPheLeuAlaGluGlyArgLysIle	406
q	1752 -		1752
οy	407 P	roGlySerAspleAspLeuGlyAsnSerHisAlaThrMetLeuThrAlaSerTrp	425
Dp	1753 -		17

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Methylococcus capsulatus genes, comprises polynucleotides or oligonucleotides representative for a selective number of Methylococcus capsulatus genes
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                    1918 CAG-----TATTTT----CCGCTGACCCAGGATCTG---ACGCTGTGGTTGAAT 1959
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 ----HisTyrLeuAsp
                                                                              1858 GGACTGTTTGCCCTGCCGTTCAGCACCCTGCAGTATTACAAGGCCAACGTGCGCCTGGAG
                                                                                                       464 AlaArgAlaGlyTyrPhePheThrProGluAsnLysLysLeuGlyThrPhelleIleArg
                                                                                                                                                                                      1960 GGCGATTTCGGTTACGGCGGCGCCTATGGCAGTGGCGGCAACAGCGTCCTTCCGTTCTGG
                                                                                                                                                                                                                              LeuAlaGlyProAsnGlySerValLeuProGluArgAlaLeuLeuValGlySerLeuGlu
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                                                  GlyLys1leGlyThrThrLeuGlyThrPheLeuSerSerThrAlaLeuIleArgThrSer
                                                                                                                                                                                                                501 LeuMetPheArgSerGlyGlyAlaSerSerValArgGlyTyrGluLeuAspSerIleGly
                                                                                                                                                             484 GlyGlnAlaGlyTyr-----ThrValAlaArgAspAsnAlaAspValProSerGly
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     ds; differential expression; gene expression
                                                                                                                                                                                                                                                                                                                                                                                                                                 GlyLeuGlyValArgTrpPheSerProLeuAlaProPheSerPheAspIleAla 591
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Durkin AS;
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Fraser CM,
LysArgGlnLeuLeuAsnAsnValLeuHisProGluAsnGly
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Eisen JA,
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            capsulatus gene #9 for DNA array
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              .4-JAN-2002; 2002WO-NO00019
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12-JAN-2001; 2001NO-0000239
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   (first entry)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Methylococcus capsulatus
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             ABQ90024 standard;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Micro array; gene;
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Lillehaug JR,
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Salzberg S
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         ABQ90024;
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number of Methylococcus capsulatus genes. The method of the invention is useful for determination of the differential expression of the genes of M. capsulatus, and for studying gene expression on a genomic scale and in gene expression assays of M. capsulatus genes. The sequences shown in ABQ90016-ABQ91855 represent M. capsulatus genes for use in arrays of the
                                          relates to a novel DNA array giving a representation of a sylococcus capsulatus genes. The method of the invention is
                                                                                                                                                                                                                                                                                                                                                                                          229 TACCTGCCTGTCCGGGGGGGGGGGACACCCTCGATGAAAAACGGTCGGCCGAGGTGATCCGG 288
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       GluAsnSerLysThrSerValLeuGlyAlaValThrArgLysGlyTyrProLeuAlaLys 195
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CTCAAGGGAATCGGGCTGGCGGAGGGAAGGTATTCGACCGGCAGATTCTCGACAAGGTC
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         661 AGTGATGATCTGACCCAGGATTTTGAGCTGAGTACATCCCAATCTCCTGTCTTTCTAT
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                                                                                                                                                                                                                                                                                                                                                                                                                              AlaLeuPheLysAsnLysSerProAspThrGluSerValLysLeuLysProLysPhePro
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                                                                                                                                                                                                                                                                                                                                                                 TyralaProalaAlaAsp-----LeuSerGluAsnLysAlaAlaGlyPhe-
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                                                                                                                                                                      687 G; 515 T; 0 other;
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151
99
259
249
29
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Matches:
Conservative:
Mismatches:
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Gaps:
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             678pp; English
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234.50
32.98%
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Best Local Similarity:
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                                            The invention
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             19;
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a	1111	TTTTCGTCGATCCGGGCAAACAGGTCTACGTGAGGCGAATCAATTTCCAGGGCAATACC 1170	ò	541
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ò	264	LeuGluGlnAsnGlyHisTyrSerGlyAla 273	δλ	555
셤	1231	ACCGCGAAGATCGAGCGTTCCAAGACCAGGTCGAGGCGTCTCGGCTATTTCCAGGATGTC 1290	qq	2200
ò	274	ServalGlnAlaAsoPheAsoArdLeuGlnGlvAsoArdValProValLysValSerVal 293	Ολ	574
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; f	1351		ID X	ID AAS81
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è 1	314	GIYGIYLYSIIGALATYFASPIYFTYTASNLEUPNEASNLYSGIYTYFIIGGIYSEFVAL	XX	13-FE
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g	1531	ACCCTGGATGGCATCAGCAGTTTCGACATCAGCTATCGCGACACCAACACCGGCTAT 1590	V A	W0200
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ò	444	GlyLyslleGlyThrThrLeuGlyThrPheLeuSerSerThrAlaLeuIleArgThrSer 463	388	polym and g
g	1858		38	polyn for i

invention relates to isolated polynucleotide (1) and beptide (11) sequences. (1) is useful as hybridisation probes, nerase chain reaction (PCR) primers, oligomers, and for chromosome gene mapping, and in recombinant production of (II). The nucleotides are also used in diagnostics as expressed sequence tags identifying expressed genes. (1) is useful in gene therapy techniques CCCAGGGACAGCGTGGCTTCGGCGGCAACAGCAACTGACCGGCTGGGTGGAG 2139 TIGCIGITICGGICCCGITIGCGGGCGAGAAACTGAAGAGIGICCGCITGGGIACCTIC 2199 CAG-----TATTT-----CCGCTGACCCAGGATCTG---ACGCTGTGGATT 1959 LeuAlaGlyProAsnGlySerValLeuProGluArgAlaLeuLeuValGlySerLeuGlu 540 -----TyrGlnLeuProPheThr------ArgThrLeuSerGlyAlaValPhe 554 HisAspMetGlyAspAlaAlaAlaAsnPheLysArgMetLys---LeuLysHisGlySer 573 3lyGlnAlaGlyTyr-----ThrValAlaArgAspAsnAlaAspValProSerGly 500 AlaargalaGlyTyrPhePheThrProGluAsnLysLysLeuGlyThrPheIleIlearg 483 ; chromosome mapping; gene mapping; gene therapy; forensic; supplement; medical imaging; diagnostic; genetic disorder; ss. solated polynucleotide and encoded polypeptides, useful in ostics, forensics, gene mapping, identification of mutations maible for genetic disorders or other traits and to assess 31yLeuGlyValArgTrpPheSerProLeuAlaProPheSerPheAspIleAla 591 ncoding novel human diagnostic protein #17701. 1; SEQ ID No 17701; 103pp; English. BP. 897 standard; cDNA; 1425 Tang YT; R-2001; 2001WO-US08631. R-2000; 2000US-0540217. G-2000; 2000US-0649167. B-2002 (first entry) 2001-639362/73. ac RT, Liu C, -) HYSEQ INC. B; ABG17710 175067-A2. sapiens. versity r-2001. 897;

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(II). (II) is useful for generating antibodies against it, detecting or quantitating a polypeptide in tissue, as molecular weight markers and as a food supplement. (II) and its binding partners are useful in medical imaging of sites expressing (II). (I) and (II) are useful for treating disorders involving aberrant protein expression or biological activity. The polypeptide and polynucleotide sequences have applications in diagnostics, forensics, gene mapping, identification of mutations responsible for genetic disorders or other traits to assess biodiversity and to produce other types of data and products dependent on DNA and amino acid sequences. Anset 197-AAS94564 represent novel human
                                                                                                                                                                                                            diagnostic coding sequences of the invention.

Note: The sequence data for this patent did not appear in the printed specification, but was obtained in electronic format directly from WIPO at ftp.wipo.int/pub/published_pct_sequences.
restore normal activity of (II) or to treat disease states involving
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                                                                                                                                                                                                                                                                                                            Sequence 1425 BP; 299 A; 353 C; 407 G; 366 T; 0 other;
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The invention relates to isolated polynucleotide (I) and probes, polypeptide (II) sequences. (I) is useful as hybridisation probes, polypeptide (II) sequences. (I) is useful as hybridisation probes, polymerase chain reaction (PCR) primers, oligomers, and for chromosome and gene mapping, and in recombinant production of (II). The color polynucleotides are also used in diagnostics as expressed sequence tags of for identifying expressed genes. (I) is useful in gene therapy techniques to restore normal activity of (II) or to treat disease states involving (II). (II) is useful for generating antibodies against it, detecting or quantificating a polypeptide in tissue, as molecular weight markers and as a food supplement. (II) and its binding partners are useful in medical insight of sites expressing (II). (I) and (II) are useful for treating disorders involving aberrant protein expression or biological activity. The polypeptide and polynucleotide sequences have applications in diagnostics, forensics, gene mapping, identification of mutations and to produce other types of data and products dependent on DNA and and contact coding sequences. Asset JP7-Assets fepresent novel human and against the coding sequences the invention.
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                                                                                         n; chromosome mapping; gene mapping; gene therapy; forensic; supplement; medical imaging; diagnostic; genetic disorder; ss.
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23-AUG-2000; 2000US-0649167.
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GCTGTTATGTGGAGTCCCAAATTACTAGCAGGCAGATGGCCCCAGTGGTGTGGCA---GG 1242
                                         1241 ACCATGGACAGCGCCCACCGGGCTATTCTGCGAGCCCAGCCCCAGGCGCAGAACGTCTGGA 1182
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                                                                                                                                                      alArgGlyTyrGluLeuAspSerIleGlyLeuAlaGlyProAsnGlySerValLeuProG
                                                                                                                                                                                                                                                                941 GCGCGGTGTTTGTCGATAGTGGCGAAGCGGTAAGCGATATTCGCCGCAGCGACTTTAAAA
                                                                                                                                                                                                                                                                                      571 isGlySerGlyLeuGlyValArgTrpPheSerProLeuAlaProPheSerPheAspIleA
                                                                                                                                                                                                                                                                                                    yThrPheLeuSerSerThrAlaLeuIleArgThrSerAlaArgAlaGlyTyrPhePheTh
                                                                rProGluAsnLysLysLeuGlyThr-PheIleIleArgGlyGlnAlaGlyTyrThrValA
                                                                                                          laArgAspAsnAlaAspValProSerGlyLeuMetPheArgSerGlyGlyAlaSerSerV
                                                                                                                                                                                                531 luArgAlaLeuLeuValGlySerLeuGluTyrGlnLeuProPheThrArgThrLeuSerG
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Moraxella catarrhalis BASB081 mature protein coding region.
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P-PSDB; AAY95988.
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The present sequence is that of DNA encoding BASB081 mature protein (see AAY9588) of Moraxella catarrhalis Mc2931 (ATCC 4367). It was obtained by sequence shows 99.8 identity to a mature BASB081 collaboration provides BASB081 collaboration provides BASB081 polypeptide from M. catarrhalis ATCC 43617. The invention provides BASB081 polypeptides, polynucleotides, capression vectors, host cells, and a process for producing a BASB081 polypeptide or polyneptide or polynucleotide, and optionally at least 1 polypeptide or polynucleotide, and optionally at least 1 cother M. catarrhalis antigen. A method for diagnosing a M. catarrhalis infection involves identifying a BASB081 polypeptide, or an antibody that is immunospecific for it, in a sample. A catarrhalis infection useful in recating M. catarrhalis diseases in humans composition useful in recating M. catarrhalis diseases in humans comprises an antibody directed against a BASB081 protein. The disease can be a bacterial infection, e.g. otitis media in confidential infection, of infants and chidren, pneumonia in elderides, sinustis, nosocomial infections and invasive diseases, chronic otitis media with hearing loss, fluid accumulation in the middle ear, auditive nerve damage, inflammation of the middle ear.
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      474 TCTATT-----TTGGGCAGAATCAGCGATGCCGTATCTGCC------TTGGGCAGAATCTGCCGTATCTGCC
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Claim 8; Page 60-61; 97pp; English.
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Query Match:
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Moraxella catarrhalls.
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                                                                                                                                277 AlaAspPheAspArgLeuGlnGlyAspArgValProValLysValSerValThrGluVal 296
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                                                                                 258 LeuAspPheGlnGlnAlaLeu---GluGlnAsnGlyHisTyrSerGlyAlaSerValGln 276
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                                  Gln11eValSerGlyLeuAlaArgPheGlnProGlyThrProTyrAspLeuAspLeuLeu
2065 CAAGAGGCGTTATTGGCAGGTGTTGCTGTG-----
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New BASBO81 polypeptides from Moraxella catarrhalis and polynucleotides encoding the polypeptides used for treating infections, or as a vaccine for preventing infections, especially those caused by M. catarrhalls .
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gene from Moraxella catarrhalis Mc2931 (ATCC 43617). A translation

of the sequence is given in AAV95987. The present sequence shows

confidentity to a BASB081 sequence (see AAA50537) obtained by PCR

amplification of plasmid DNA. The invention provides BASB081

conjugations of polynocleotides, expression vectors, host cells, and

a process for producing a BASB081 polypeptide. Also provided are

vaccine compositions comprising a BASB081 polypeptide or

polynocleotide, and optionally at least 1 other M. catarrhalis

antigen. A method for diagnosing a M. catarrhalis infection

involves identifying BASB081 polypeptide, or an antibody that is

involves identifying a BASB081 polypeptide, or an antibody that

cimmunospecific for it, in a sample. A therapeutic composition

useful in treating M. catarrhalis diseases in humans comprises

can antibody directed against a BASB081 polypeptide. The
                                                                                                                                                                            2578 CCTGTCGGTCAAGTTCGTGTTGATGTGGCAACTGGTGTCAAAGAAGAAGAGGCCAATCCCATT 2637
2518 GATAAAGGCTTTACTAATGATACCAAAATTGGTGCAGGTGTCGGTGTTCGCTGGGCATCA 2577
                                                                                          ProLeuAlaProPheSerPheAspIleAlaTyrGlyHisSerAspLys....LysIle
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/note= "corresponds to base 1003 of AAA50537"
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                                                                                                                                                                                                                                                                                                               2638 AAGCTGCATTTTTTTTTTGCACACCATTT 2667
                                                                                                                                                                                                                                                                  ArgTrpHisIleSerLeuGlyThrArgPhe 609
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Location/Qualifiers
1.2670
/*tag= a
1.1.90
/*tag= b
91.2757
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           AAA50536 standard; DNA; 2760 BP
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replace(1093,A)
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1675 CGCAAGACCCCTGCT------1710
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          122 TyrThrValHisIleThrProGlyProArgThrLysIleAlaAsnValGlyValAlaIle 141
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and children, pneumonia in elderlies, sinusitis, nosocomial infections and invasive diseases, chronic otitis media with hearing loss, fluid accumulation in the middle ear, auditive nerve damage, delayed speech learning, upper respiratory tract infection, and inflammation of the middle ear.
                                                                                                                                                                                                                                                                                                                                                                  TTTAGTGCATCTAATCTGATTCAAGACAAGCTAAATTTGGTGGCTGCCAAGGCTCGCCAT
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317 IlealaTyrAspTyrTyrAsnLeuPheAsnLysGlyTyrIleGlySerValValTrpAsp 336
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                                                                       |||| TTTGATTTATCCACACGCACCCTAGAGCATGAGATTAGCCGCAGTATTATCCAAAATGGT
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                           -----TATCAACAAGAAGTTTTTGGTCACTCTACCAATGGT
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The present invention relates to a Moraxella catarrhalis genomic library comprising of a combination of 41 nucleic acid molecules (see AAF28514-AAF28554). The library has a number of uses described in the specification e.g. is useful for aidentifying diagnostic and therapeutic compositions. M. catarrhalis (Branhamella catarrhalis) is a large acrobic, gram-negative diplococcus, normally found among the bacterial flora of human upper alrways. M. catarrhalis is known to cause acute, localised infections such as othits media, sinusitis and bronchopulmonary infection and life-threatening, systemic diseases including endocarditis
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                                                                                                                                                                                                                                                                                                                                Genomic library for identifying diagnostic and therapeutic compositions, and for identifying virulence factors, regulatory elements and drug targets, comprises Moraxella catarrhalis nucleic
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                                                                           Moraxella catarrhalis
Genomic fragment #34
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Best Local Similarity:
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                                     TrpGlnGlnProValGlySerAspPheAspGlnAspSerTrpGluAsnSerLysThrSer
                                                                         82071 CGCAAGACCCCTGCT------GATGTCTATCAAAGTAAAAA----
                                                                                                             182 ValLeuGlyAlaValThrArgLysGlyTyrProLeuAlaLysLeuGlyAsnThrArgAla
                                                                                                                                                                                      202 AlaValAsnProAspThrAlaThrValAspLeuAsnValValValAspSerGlyArgPro
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                                                                                                     502 MetPheArgSerGlyGlyAlaSerSerValArgGlyTyrGluLeuAspSerIleGlyLeu
               82824 CGTTTTTTTCCTGCTGCCGACCAAGTATTCGTGGATATGCACATGACAGTTTATCACCT
                                                                            82884 ATATCAGATAAGGGTTATCTGACAGGCGGTCAAGTATTGGCGGTTGGTACAGCTGAATAT
                                                                                                                                 82944 AATTATGAATTTATGAAAGATTTGCGTTTGGCGGTTTTTGGTGATATTGGTAATGCTTAT
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                                                     1905 ACTTATGGAAGTAATGTTAGGTTTCCCTGTAAATGAAATAACTCCTATTATGTA 1964
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This invention relates to the cDNA and protein sequences of a novel BASB207 protein. The proteins of the invention may have antibacterial carti-inflammatory activity and may be used to create a vaccine. The BASB207 polypeptides and polynucleotides are useful as vaccines against bacterial infections particularly those caused by non-typeable H. Influenzae, including pneumonia, exacerbation of chronic bronchitis, sinusitis and oittis media; as immunogens to produce antibodies immunospecific for such polypeptides and polynucleotides, These may also be used in diagnosing the stage of infection and type of infection the pathogen has attained. The polynucleotides may be further used in genetic immunisation, as components of polynucleotide arrays useful for diagnostic and prognostic purposes, in the discovery and development of antibacterial compounds, and to interfere with the initial physical interaction between a pathogen and a eukaryotic host responsible for sequelae of infection. Compositions comprising the sequences of the invention are useful in the preparation of a medicament for generating an immune response in an animal. The present sequence represents the upstream DNA sequence of the Haemophilus influenzae BASB207 CDNA of
                                                                                                                                                                                                                                                                                                                                                                                                                                              New BASB207 polypeptides and polynucleotides, useful as vaccines against bacterial infections particularly those caused by non-typeable Haemophilus influenzae, e.g. pneumonia, sinusitis and otitis media -
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                Haemophilus influenzae strain BASB207 upstream nucleotide sequence
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                                                    BASB207; antibacterial; anti-inflammatory; vaccine; 9s;
bacterial infection; influensa; pneumonia; bronchitis; sinusitis;
                                                                                          otitis media; infection; immunisation; antibacterial.
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                                                 AlaValPheHisAspMetGlyAspAlaAlaAlaAsnPheLysArgMetLysLeuLysHis
                  747 GCAACTTTTGCAGATAGTGGATTAGCCGCTAA-TATTACACAGCAAAAGAGCTGCGTTAT
                                                                                                                     GlySerGlyLeuGlyValArgTrpPheSerProLeuAlaProPheSerPheAspIleAla
                                       532 ArgAlaLeuLeuValGlySerLeuGluTyrGlnLeuProPheThrArgThrLeuSerGly
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Nucleic acid encoding D15 outer membrane protein - esp. of Haemophilus influenzae, and related proteins, vectors, antiseraetc. useful in vaccines, for diagnosis and for passive
                                                                                                                                                                                                                                                                                                        passive immunization; vector; antiserum; diagnosis;
er membrane protein; NTHi; ss.
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P-PSDB; AARS3757.
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          326 AsnLysGlyTyrIleGlySerValValTrpAspMetAspLysTyrGluThrThrLeuAla 345
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            286 ArgValProValLysValSerValThrGluValLysArgHisLysLeuGluThrGlyIle 305
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                SerGlyGlyIle-----TrpTyrValArgAspArgAlaGlyIleAspAlaArgLeu 395
                                                                                                                                                                                                                                                                                                                                                                          152 AlaGluTyrTyrArgAsnAlaLeuGluAsnTrpGlnGlnProValGlySerAspPheAsp 171
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         172 GlnAspSerTrpGluAsnSerLysThrSerValLeuGlyAlaValThrArgLysGlyTyr 191
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           207
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                                                                                                                                                                                                                                                              134 IlealaAsnValGly-----ValAlaIleLeuGlyAspIleLeuSerAspGlyAsnLeu
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               208 AlaThrValAspLeuAsnValValValAspSerGlyArgProIleAlaPheGlyAspPhe
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               GluileThrGlyThrGlnArgTyrProGluGlnIleValSerGlyLeuAlaArgPheGln
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 306 ArgLeuAspSerGluTyrGlyLeuGlyGlyLysIleAlaTyrAspTyrTyrAsnLeuPhe
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2974
121
75
241
241
221
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                                                                                                                                                                                                     US-09-857-669-2 (1-609) x AAQ66201 (1-2974)
                                                                                                                                                                                                                                                                                                                                                                                                                                L253 AATGATACTTTCCGCCGTAGT--
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                            -------TTTTCTTTTGGTTGGAACTATAACAGCCTTAATAGAGGCTATTTCCCA 2122
                                                                     2123 ACTAAAGGG-----GTTAAAGCAAGTCTTGGTGGACGAGTTACAATTCCAGGTTCTGAT 2176
                                                                                                                2177 AACAAATACTACAAACTAAGTGCAGATGTACAGGGTTTCTACCCATTAGACAGAGATCAC 2236
                                                                                                                                                         2237 CTCTGGGTTGTATCTGCAAAAGCATCTGCAGGATATGCAAATGGTTTTGGAAACAAGCGT 2296
                                                                                                                                                                                                                                                                                                                                                                           2528 GATGCGGCAAGTGTTTGGAATACTAAATGGAAATCAGATAAAAATGGATTAGAGAGCAAT 2587
                                                                                                                                                                                                                                                                                                                                                                                                            2699 CCAATTAAAAAATGTAAAATGATGTCGAA---CAGTTCCAATTTAGTATTGGGGGT 2755
                                                                                                                                                                                                    2297 TTACCGTTCTATCAACTTATACAGCGGGGGGCATTGGTTCATTACGCGGTTTTGCTTAT 2356
                                                                                                                                                                                                                                                                                                                                                        552
                                                 437 GluAsnGlyHisTyrLeuAspGlyLysIleGlyThrThrLeuGlyThrPheLeuSerSer 456
                                                                                                                                     LeuGlyThrPheIleIleArgGlyGlnAlaGlyTyrThrValAlaArgAspAsnAlaAsp 496
       HisAlaThrMetLeuThrAlaSerTrpLysArgGlnLeuLeuAsnAsnValLeuHisPro
                                                                                           457 ThralaLeulleargThrSeralaArgAlaGlyTyrPhePheThrProGluAsnLysLys
                                                                                                                                                                                                                        517 AspSerIleGlyLeuAlaGlyProAsn----------
                                                                                                                                                                                                                                              -------GlySerValLeuProGluArgAlaLeuLeuValGlySerLeuGluTyrGln
                                                                                                                                                                                                                                                                                  2408 AAGATAAGTICTGAIGIGATIGGIGGIAATGCAATCGCTACAGCTAGGCAGGITAAIT
                                                                                                                                                                                                                                                                                                                                 2468 GTGCCAACTCCATTTGTGAGTGATAAGAGTCAAAATACAGTCCGAACCTCCCTATTTGTT
                                                                                                                                                                                                                                                                                                                                                        573 SerGlyLeuGlyValArgTrpPheSerProLeuAlaProPheSerPheAspIleAla---
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    -----TyrGlyHisSerAspLysLysIleArgTrpHisIleSerLeuGlyThr
                                                                                                                                                                               497 ValProSerGlyLeuMetPheArgSerGlyGlyAlaSerSerValArgGlyTyrGluLeu
                                                                                                                                                                                                                                                                                                                                                                                               553 ValPheHisAspMetGlyAspAlaAlaAlaAsnPheLysArgMetLysLeuLysHisGly
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Vaccine; passive immunization; vector; antiserum; diagnosis; D15;
                                                                                                                                                                                                                                                                                                              ---PheThrArgThr------
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Haemophilus influenzae type b Eagen strain.
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Location/Qualifiers
374..2767
/*tag= a
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  2756 TCTTTC 2761
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1163 CTFCGTAGTGCACGCATTATAGGTAATCTGGGAGGTATGTCTGCCGAGCTTGAACCTTTA 1222
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   .043 GATTATTATTATAAATAATGGCTATGCCAAAGCACAAATTACTAAAACGGATGTTCAGCTA 1102
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Outer membrane protein (OMP) D15 genes were isolated by screening chromosomal libraries of H. influenzae type b (H1b) strains Ca, Eagan and Minn A, and the non-typeable (NTH1) strains SB33 and PAK 12085. Nucleotide sequences were determined for the D15 genes (AAQ66198-202) and the corresponding as sequences were derived (ARRS754-58). D15 OMP can be produced easily and on a large scale, free of other antigens and lipooligosaccharides, by recombinant DNA methods using the isolated genes.
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       166 ValGlySerAspPheAspGlnAspSerTrpGluAsnSerLysThrSerValLeuGlyAla 185
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     186 ValThrArgLysGlyTyrProLeuAlaLysLeuGlyAsnThrArgAlaAlaValAsnPro 205
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 GluValLeuAspLysGluGlnThrGlyPheLeuAlaGluGluAlaProAspAsnValLys 100
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          -----GluLysAspGlyAla---TyrThrValHisIleThrProGlyProArgThrLys 133
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 61 AspSerGluIleLysAspMetValGluGluH1sLeuProLeuIleThrGlnGlnGlnGlu
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               ------valAlaleLeuGlyAspIle
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     923 GAATCTGTTAGTAGCAGTACATTACAAGAACAAATGGAATTACAACCTGATTCTTGGTGG
                                                                                                                                                                                                                                                                                                                                Nucleic acid encoding D15 outer membrane protein - esp. of Haemophilus influenzae, and related proteins, vectors, antisera etc. useful in vaccines, for diagnosis and for passive
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            ThrMetLeuArgSerLysGlyTyrPheSerSerLysValSerLeuThr-----
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Sequence 2984 BP; 960 A; 474 C; 619 G; 931 T; 0 other;
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103
280
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Mismatches:
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Matches:
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Best Local Similarity:
                                                                                                                                                                                                                                                                                  P-PSDB; AAR53755
23-NOV-1993;
                                                                                                                                                                                                                                                                                                                                                                                                                         Immunisation
                                                      33-NOV-1992;
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qα	1304	GAACGCGGTTACGGTAGCGCAACGGTAAATTCAGTACCT 1342		,
ò	206	AspThralaThrValAspLeuAsnValValAspSerGlvAraPro 221	0у	526
q	1343		g	
ΟY	222	IlealaPheGlyAspPheGluIleThrGlyThrGlnArgTyrProGluGlnIleValSer 241	oy.	
qq	1403	::: TTAACTGTTCGCCAACTTCGCTTTGAAGAAATACCGTTTCTGCTGATAGCACTTTACGT 1462	අ	
οy	242	GlyLeuAlaArgPheGlnPro	δλ	
Q	1463		q	2498 AGCCAA
δ	262		δλ	
QQ	1523		셤	2558 TGGAAA1
ò	282	LeuGlnGlyAspArgValProValLysValSerValThrGluValLysArqHis	0y	268
q	1577	:::	qa	
δ	300	300 LysLeuGluThrGlyIleArgLeuAspSerGluTyrGlyLeuGlyGlyLysIleAlaTyr 319	δy	585 ProPhe:
q	1637	::: ::: AGTATCAACTTTGGTATTGGTTACGGTACAGAGAGTGTTATGAAGCAAGTGTT 1696	qq	2678 CCATTGO
0y	320	AspTyrTyrAsnLeuPheAsnLysGlyTyrIleGly	ō,	600 ArgTrp
q	1697	 1697 aaacaagataattictigggaacagggggggggggggatataggtggtacgaaaatgat 1756	ପ୍ର	2735 CAGTTC
Οy	340	TyrGluThrThrLeuAlaAlaGlyIleSerGlnProArgAsn 353	RESU AAO6	
q	1757		G X	AAQ66200 sta
ò	354	TyrargGlyAsnTyrTrpThrSerAsnValSerTyrAsnArgSerThrThrGlnAsn 372	XX XX	AAQ66200;
q	1817		TQ XX	08-DEC-1994
0y	373	LeuGluLysArgAlaPheSerGlyGlyIleTrpTyrValArgAspArgAla 389	DE XX	H. influenza
q	1877	::::: TATAAGCGTACGACTTACGGAAGTAATGTTACTTTAG	KW	Vaccine; pas OMP; outer n
0y	390		xx SO	Haemophilus
QΩ	1937	TCCTATTATGTAGGATTAGGTCATACCTATAATAAAATTAGTAACTTTGCTCTAGAATAT 1996	AA FH	Key
ò	403	GlyArgLysIleProGlys	FF	SGD
q	1997	AACCGTAATTTATATATTCAATCAATGAAATTTAAAGGTAATGGCATTAAAACAAATGAC 2056	X M	WO9412641-A
ογ	411	IleaspLeuGlyAsnSerHisAlaThrMetLeuThrAlaSerTrpLysArgGlnLeuLeu 430	X Q S	09-JUN-1994
đ	2057	TTTGATTTTTCTTTTGGTTGGAACTATAACAGCCTT 2092	PF A	23-NOV-1993
ογ	431	AsnAsnValLeuHisProGluAsnGlyHisTyrLeuAspGlyLysIleGlyThrThrLeu 450	A & &	23-NOV-1992
Q	2093	AATAGAGGCTATTTCCCAACTAAAGGGGTTAAAGCAAGTCTTGGTGGACGAGTT 2146	Y & X	(CONN-) CONI
οy	451	GlyThrPheLeuSerSerThrAlaLeuIleArgThr	PI	Chong P, K
qq	2147	ACTATTCCAGGTTCTGATAACAAATACTACAAACTAAGTGCAGATGTACAGGGTTTCTAC 2206	Z X	rang r;
δ	471	ThrProGluAsnLysLysLeuGlyThrPheIleIleArgGlyGlnAlaGlyThrVal 490	283	P-PSDB; AAR
q	2207	CCATTAGACAGAGATCACCTCTGGGTTGTATCTGCAAAAGCATCTGCAGGATATGCAAAT 2266	* E. E	Nucleic act
ογ	491		I d d	etc. useful
q	2267	GGTTITGGAAACAAGCGTTTACCGTTCTATCAAACTTATACAGCGGGTGGCATCGGTTCA 2326	XX	Disclosure
ογ	511	511 ValArgGlyTyrGluLeuAspSerIleGlyLeuAlaGlyProAsn 525 :::: :::	: ¥ 8	Outer membra
a	2327	TTACGTGGTTTTGCTTATGGTAGTATTGGACCTAACGCAATTTATGCCGAA 2377	-	chromosomal

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---LysLeuLysHisGlySerGlyLeuGlyValArgTrpPheSerProLeuAla 584
::::::::
**GCGTATTCGCGCCTCTACAGGTGTCGGATTCCAATGGCAATCTCTATTGGG 2677
                               ||||:::
AATCGTAGTGGTACTGTACTTTTAAGAAGATAAGTTCTGATGTGATTGGTGGT 2437
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NTCGCTACAGCGTAGCGCAGATTAATTGTGCCAACTCCATTTGTGAGGGGATAAG 2497
                                                                                                                                                                               ||| ::: ||| :::
3TATICICTTATGCCAAACCAATTAAAAAATATGAAAATGATGATGTGGAA--- 2734
                                                                                       euLeuValGlySerLeuGluTyrGlnLeuPro-------544
                                                                                                                                                                                                                                                                                                                                                                                                                                                                        SerPheAspIleAla-----TyrGlyHisSerAspLysIle 599
-----GlySerValLeuProGlu 531
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             ane protein (OMP) D15 genes were isolated by screening libraries of H. influenzae type b (Hib) strains Ca,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 ssive immunization; vector; antiserum; diagnosis; D15; membrane protein; Hib; ss.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          d encoding D15 outer membrane protein - esp. of influenzae, and related proteins, vectors, antisera in vaccines, for diagnosis and for passive
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               lein M, Loosmore S, Sia DYC, Thomas W;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   influenzae type b Minn A strain.
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  HisIleSerLeuGlyThrArgPhe 609
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Fig. 1C; 161pp; English.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   ae b Minn A D15 sequence.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Location/Qualifiers
334..2727
/*tag= a
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             andard; DNA; 2953 BP.
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| AATGATGAAAAAACAAAAGTTAATGTAAATGAAATGAAGGTTTACAGTATGAC 1122
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                943 AAATTATGGGGAAATAAATTTGAAGGTGCGCAATTCGAGAAGATTGCAGTCAATTCGT 1002
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        GATTATTATTAAATAATGGCTATGCCAAAGCACAAATTACTAAAACGGATGTTCAGCTA 1062
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    101 ThrMetLeuArgSerLysGlyTyrPheSerSerLysValSerLeuThr------ 116
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  --- IleAlaAsnValGly-----ValAlaIleLeuGlyAspIle 145
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         221
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         LeuSerAspGlyAsnLeuAlaGluTyrTyrArgAsnAlaLeuGluAsnTrpGlnGlnPro 165
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     186 ValThrArgLysGlyTyrProLeuAlaLysLeuGlyAsnThrArgAlaAlaValAsnPro 205
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Eagan and Minn A, and the non-typeable (NTHI) strains SB33 and PAK 12085. Nucleotide sequences were determined for the D15 genes (AAQ66198-202) and the corresponding as sequences were derived (AAR53754-58). D15 OMP can be produced easily and on a large scale, free of other antigens and 1 pooligosaccharides, by recombinant DNA methods using the isolated genes.

The three 'n's are not identified in the specification.
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883 GAATCTGTTAGTAGCAGTACATTACAAGAACAAATGGAATTACAACCTGATTCTTGGTGG
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        242 GlyLeuAlaArgPheGlnProGlyThrProTyrAspLeuAspLeuLeuLeuAspPheGln
                                                                                                                                                                                                                                                                                                                                                                      AspSerGlulleLysAspMetValGluGluHisLeuProLeuIleThrGlnGlnGlnGlu
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                                                                                                                                                   Sequence 2953 BP; 948 A; 467 C; 619 G; 916 T; 3 other;
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Matches:
Conservative:
Mismatches:
Indels:
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CTTGGTGGAAATGTTTTCTTTGAAAACTACGATAACTCTAAAAGTGATACATCCTCTAAC 1836
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                                                                                   AAACAAGATAATTTCTTGGGAACAGGGGGGGGGGTAAGTATAGCTGGTACGAAAAATGAT 1716
                                                                                                                                                    TATGGTACGAGTGTCAATTTGGGTTATACCGAGCCCTATTTTACTAAAGATGGTGTAAGT 1776
                                                                                                                                                                                                                                                                                                                                                            TCCTATTATGTAGGATTAGGTCATACCTATAATAAAATTAGTAACTTTGCTCTAGAATAT 1956
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CCATTAGACAGAGATCACCTCTGGGTTGTATCTGCAAAAGCATCTGCAGGATATGCAAAT 2226
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                                                   AspTyrTyrAsnLeuPheAsnLysG1yTyr1leG1ySerVa1Va1TrpAspMetAspLys
                                                                                                                                                                                        TyrArgGlyAsnTyrTrpThrSerAsnValSerTyrAsnArgSer---ThrThrGlnAsn
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1104 TTAACTGTTCGCCAACTTCGCTTTGAAGAAATACCGTTTCTGCTGATAGCACTTTACGT 1163
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      81 GluValLeuAspLysGluGlnThrGlyPheLeuAlaGluGluAlaProAspAsnValLys 100
                                                                                                                                                            -----GluLysAspGlyAla---TyrThrValHisIleThrProGlyProArgThrLys 133
                                                                                                               744 GATTATTATTTAAATAATGGCTATGCCAAAGCACAAATTACTAAAAGGGATGTTCAGCTA
                                                                                                                                                                                                                                                                  LeuSerAspGlyAsnLeuAlaGluTyrTyrArgAsnAlaLeuGluAsnTrpGlnGlnPro
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578 TATAAGCGTACGATTACGAAGTAATGTTACTTTAGGTTTCCCTGTAAATGAAATAAC
                                        684 AAATTATGGGGAAATAAATTTGAAGGTGCGCAATTCGAGAAGATTTGCAGTCAATTCGT
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                                                                                                                                                                                                                                        .......IleAlaAsnValGly-----ValAlaIleLeuGlyAspIle
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                                                                                 101 ThrMetLeuArgSerLysGlyTyrPheSerSerLysValSerLeuThr-----
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2638 CCATTGGTATTCTCTTATGCCAAACCAATTAAAAATATGAAAATGATGATGATGTCGAA--- 2694
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Outer membrane protein (OMP) D15 genes were isolated by screening chromosomal libraries of H. influenzae type b (Hib) strains Ca, Eagan and Minn A, and the non-typeable (NTH1) strains SB13 and PAK 12085. Nucleotide sequences were determined for the D15 genes (AA60519-202) and the corresponding as sequences were derived (AAR53754-58). D15 OMP can be produced easily and on a large scale, free of other antigens and lipooligosaccharides, by recombinant DNA methods using the isolated genes.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     624 GAATCTGTTAGTAGCAGTACATTACAAGAACAAATGGAATTACAACCTGATTCTTGGTGG 683
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Nucleic acid encoding D15 outer membrane protein - esp. of Haemophilus influenzae, and related proteins, vectors, antiseraetc. useful in vaccines, for diagnosis and for passive
                                                                                                                                                                                                                                                                                                             Vaccine; passive immunization; vector; antiserum; diagnosis; OMP; outer membrane protein; Hib; ss.
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2028 TTACGTGTTTTCCTTATGGTAGTATT------GGACCTAACGCAATTTATGCCGAA 2078
1698 AACCGTAATTTATATATTCAATCAATGAAATTTAAAGGTAATGGCATTAAAACAAATGAC 1757
                                                                    AATAGAGGCTATTTCCCAACTAAAGGG-----GTTAAAGCAAGTCTTGGTGGACGAGTT 1847
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                                                                                                                                                                            451 GlyThrPheLeuSerSerThrAlaLeuIleArgThrSerAlaArgAlaGlyTyrPhePhe
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This invention describes novel DNA sequences (I) for specific detection of Pseudomonas putida KT2440. The invention also describes (1) recombinant expression vector containing (1); (2) prockaryotic or eukaryotic cells transformed or transfected with (I) or the vector of cukaryotic cells transformed or their fragments, of (I) and synthetic or expression products, or their fragments, of (I) and synthetic proteins or peptides with the same sequences (A); (5) poly- or mono-clonal antibodies (Ab) that react specifically with (A); (6) plants that contain transformed or transfected cells of (2); (7) transgenic plants that contain transformed or transfected cells of (2); (8) transgenic carrying one or more (I). (I), and their fragments, are used as probes to detecting the presence of (I). (I), and their fragments, are used as probes to detecting the presence of KT2440, particularly in presence of other or antibodies that recognice their expression products, are used for or as safe, by the National Institutes of Health, for genetic engineering work, e.g. as microbial production strains, for biological remediation and as vaccine carriers. (I) are exclusive to KT2440 with no significant homology with sequences in other bacteria (specifically the closely related pathogen P. aeruginosa). Compared with other 'safe' bacteria, It has greater catabolic activity and better survival in, and adaptation to, the rhizosphere and soil.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        70 ACCACCACGTCCGAGCTGATCACCGCGCGGGGTAACGAAGGCTACACGTTCGCTAAC 129
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          GTC---AACGGCGTGCCGCAACCCAACGACCAGGACCACGGTCGACATGTTCGTG 186
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  216 ValAspSerGiyArgProIleAlaPheGlyAspPheGluIleThrGlyThrGlnArgTyr 235
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            GAAGACGAAGTGCTGCGTCGCGAAATGCGCCASATGGAAGGCGGCTGGGCGTCGACCTAC 306
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     256 LeuLeuLeuAspPheGlnGlnAlaLeuGluGlnAsnGlyHisTyrSerGlyAlaSerVal 275
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                180 ThrSerValLeuGlyAlaValThrArgLys------GlyTyrProLeuAlaLys 195
                                                                                                                                                                                                                                                              New DNA sequences specific for Pseudomonas putida KT2440, useful as safe genetic engineering host, allow detection in presence of other related bacteria -
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           GTCGACCCGGGCAAGCGTGCCTACGTCAACCGCATCAACTACCGCGGCAACACCCAAGACC
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    236 ProGluGlnIleValSerGlyLeuAlaArgPheGlnProGlyThrProTyrAspLeuAsp
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Sequence 2019 BP; 404 A; 671 C; 603 G; 338 T; 3 other;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         2019
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Matches:
Conservative:
Mismatches:
                                                                                                                         QUIAGEN GMBH.
GES BIOTECHNOLOGISCHE FORSCHUNG MBH.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Indels:
                                                                                                                                                                 (DKFZ-) DKFZ DEUT KREBSFORSCHUNGSZENTRUM. (MEDI-) MEDIZINISCHE HOCHSCHULE HANNOVER.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       US-09-857-669-2 (1-609) x AAF61065 (1-2019)
                                                                                                                                                                                                                                                                                                                                                        Claim 1a; Page 117-118; 158pp; German.
                                                                                                    INST GENOMIC RES
                                                            99DE-1035088,
                   99DE-1035088
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            7.59e-09
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Percent Similarity:
                   27-JUL-1999;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Alignment Scores:
                                                                                                                       (QUIA-)
(GBFB )
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qq	307 (::: ::: ::: ::: ::: :::	qa	-
è	276	GlnalaacnphoacnardonGlnGlvacnardvalproval[vsValScrValThrd]n 295	δλ	574
5 5		official statements of the control o	qq	1387 CT
3 8		1 - 1 - 1 - 1 - 1 - 1 - 1 - 1 - 1 - 1 -	Qy	586 Ph
÷ 8	427,(<pre>290</pre>	qq	1447 CT
2	i		RES	RESULT 38
ò		GlyGlyLysIleAlaTyrAspTyrTyrAsnLeuPheAsnLysGlyTyrIleGlySerVal 	AAV:	AAV25138 ID AAV2513
셤	487 (GGTGGTTCGATCAGCCAGAGCAACTTCCTCGGTACCGGTAACAAGGTATCCATC 540	XX	AAV2513
δλ		ValTrpAspMetAspLysTyrGluThrThrLeuAlaGlyIleSerGlnProArgAsn 353	XX	13-JUL-
q	541	GGCCTGACCCGTTCGGAATACCAGACCAAGTACAACTTCGGCTTCGTCGATCCC 594	XX E	н рујо
ογ	354	TyrArgGlyA	X	D. 1.1
qq	565	TACTTCACCGCGACGGTGTCAGCCTGGGCTACAACCTGTTCTACAAC 642	KW KW	cycopia identif
ò	367	367 ArgSerThrThrGlnAsnLeuGluLysArgAlaPheSerGlyGlyIleTrpTyrVal 385	KK	cell en
qq	643	AGCACCGACTACAGCG	OS XX	Helicob
δλ	386	ArgAspargAlaGlyIleAspAlaArgLeuGlyAlaGluPheLeu 400	YY E	Key CDS
q	691	ATCAACAGCTACGGCGCGGGGTCAGCTTTGGCTACCCGATCAACGAAACCTCGCGCCTG 750	FT	3
Oy	401	AlaGluGlyArgLysIleProGlySerAspIleAspLeuGlyAsnSerHisAlaThrMet 420	V A	WO97370
qa	751		Y Q ?	09-0CT-
ογ	421	LeuThralaser 424	AA PF	27 - MAR-
q	811		PR 1	06-DEC-
ò	425		A R	29-MAR- 02-APR-
qo	871	TGGTCGGAATCTACCCTCAACAAAGGCGTACTGGCCACCCGGGGCCACTCGCAGAGCCTG 930	¥ # \$	28-0CT-
ολ	444		PA	(ASTR)
q	931	ACGCTGATGGCTACCACCCTGGCAGCGACCTGTCGTTCTACAAACTCGACTACAAC 987	VV Id	Alm RA,
Qy	464	AlaArgAlaGlyTyrPhePheThrProGluAsnLysLySLeuGlyThrPheIleIleArg 483	AA DR	WPI; 19
qq	986	GGCCAGGCTTTCCTGCCGGTGACCAGCAACACCACGCTGCGCCTGCAC 1035	ž X E	r robb,
ò	484		7.5.	polypep
đ	1036	ACCAACCTGGGCTACGGCTATGGCTCCACCGACGCTTGCCGTTCTATGAAAGC 1095	TX X	infecti
0y	503		PS XX	Claims
qq	1096	TACAACGCCGGTGGGCGCGGTGCGGGTTCAAGGACGCCCTC 1146	ខ្លួន	rnis se protein
ογ	523		388	infecti
q	1147	GGCCCCGCGCAGCACCCGGCTACCGGGCCTATTCCAACGCTGGGCAGGCTTACTATTCC 1206	388	DNA and
ογ	528		388	acid se
đ	1207	GACCGCGACACCGA	388	against
ολ		GlnLeuProPheThrArgThrLeuSerGlyAlaValPheHisAspMet 557	888	H. pylc
g			88	for ORE
οy	558	GlyaspalaAlaAsnPheLysArgMetLysLeuLysHisGlySer 573	88	vaccine

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is sequence encodes a H. pylori cell envelope outer membrane otein having a terminal phe residue.

Protein may be used in a vaccine to prevent or treat H. pylori percein or to identify H. pylori polypeptide binding compounds, fection or to identify H. pylori ploepypeptide binding compounds, and probes derived from it may be used for the identification of pylori in a sample and the diagnosis of H. pylori infection. Nucleic pylori in a sample and the diagnosis of H. pylori in RNA. Antibodies a sequences complementary to the DNA act as antisense sequences and n. be used to prevent the translation of H. pylori mRNA. Antibodies a first the protein can be used in immunoassays to evaluate the abundance of distribution of H. pylori-specific antigens. The genomic sequence of pylori (ATCC 55679) was determined from overlapping contys generated mechanically shearing the bacterial DNA. The sequences were analysed to KF of at least 180 nucleotides, and the predicted coding regions fined by computer evaluation. To identify likely H. pylori antigens for cannelysed for significant homology to other known or exported
                                                              CAACGTGTATGCCGACACCTGCTACCTGTCCACCAAGGCTGCGGCAGGGTCGAC 1386
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               usmic; vaccine; prevention; treatment; infection; envelope; lication; binding compound; bacteria; life cycle; activator; cor; duodenal ulcer disease; chronic gastritis; diagnosis; nvelope outer membrane protein; OMP; ds.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         tide(s) - useful in vaccines to treat or prevent H. pylori
on and for diagnosis of H. pylori infection
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       ri cell envelope OMP ORF 05ep10815_4719175_c1_115.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           acter pylori nucleic acid sequences and encoded
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    5,6,21; Page 929,930; 1145pp; English.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Location/Qualifiers
1..2778
/*tag= a
                                                                                                                                                                                                                                                                                                                                                                                 standard; DNA; 2778 BP.
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96US-0625811.
96US-0758731.
96US-0736905.
96US-0738859.
                                                                                                                                                                                                                          GAGTTTCAGCCTGGCG 1464
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                                                                                                                                                                                          eSerPheAspIleAla 591
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         (first entry)
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1996;
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1996;
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8888	membi inter ampli hosts	rane proteins. rest, particula ification for s	membrane proteins. Having identified and of interest, particular regions can be isolatemplification for recombinant polypeptide hosts.	led and determined be isolated from H /peptide productio	the sequences . pylori by PC n, e.g. in E.	of R coli
X O	Sequence	2778 BP;	813 A; 514 C; 68:	1 G; 770 T; 0	other;	
Alig Pred Scor Perc Best Query DB:	Alignment Sc Pred. No.: Score: Percent Simi Best Local S Query Match: DB:	Alignment Scores: Pred. No.: Score: Percent Similarity: Best Local Similarity: Ouery Match:	4.25e-06 174.00 33.67% 21.43% 5.48%	Length: Matches: Conservative: Mismatches: Indels: Gaps:	2778 126 72 197 194 23	
ns-0	9-857	-669-2 (1-609)	x AAV25138 (1-2	2778)		
oy Og	186 1102	ValThrArgLysGlyTyrProLeuA ::: ATCGCCGATAAGGGCTATGCGTT-	ValThrArgLysGlyTyrProLeuAlaLysLeuGlyA ::: ATGGCCGATAAGGGCTATGCGTTT	D) I	nThrargalaalaValAsnPro	205
ογ	206	AspThrAlaThrVe	AspThrAlaThrValAspLeuAsnValValVal 	alval	AspSerGly	219
qq	1141	GACTTGGATAAAGA	ACGAAAAAAACGGGCT	TGTGAAAGTCATTTA	GACTTGGATAAAGACGAAAAAAGGGGCTTGTGAAAGTCATTTATCGTATTGAAGTGGGC	1200
Oy Dp	220 1201	ArgProllealaP) ::: GATATGGTGCATA1	heGlyAspPheGluIl CAATGATGTCATCAT	leThrGlyThrGlnar ::: TTCAGGGACCAGCG	ArgProllealaPheGlyAspPheGluIleThrGlyThrGlnargTyrProGluGlnIle :::	239 1260
Qy Dp	240	ValSerGlyLeuAl ::: ATTAGGAGGGAATT	laArgPheGlnProGl - 	LyThrProTyrAspLe -::: AGATAAATACAACTT	ValSerGlyLeuAlaArgPheGlnProGlyThrProTyrAspLeuAspLeuLeuLeuAsp::: 	259
ò	260	PheGlnGlnAlaLe	euGluGlnAsnGlvHi	STyrSerGlvAlaSe	rValGlnAlaAspPhe	279
음	1321	TCCGAAAATTCTTT	II ::: III rgaggggtttagggtt	FTTTCTCTAA	TCCGAAAATETTTGAGGGTTTTAGGGTTTTTCTCTAAAGTCAAGATTGAAGAA	1374
λo :	280	AspArgLeuGlnG]	AspargLeuGlnGlyAspargValProValLysValSerValThrGluValLysArgHi	alLysValSerValTh	AspargLeuGlnGlyAspargValProValLysValSerValThrGluValLysArgHis	σ.
Q	1375	AAAAGGGTCAATAG	SCTCATTGATGGATTT	IGTTAGTGAGCGTAGA	AGAGGGGGGCACCGGG	1434
S G	300	LysLeuGluThrGl ::: ::: CAGTTGCAATTCGC	LysLeuGluThrGlyIleArgLeuAspSerGluTyrGlyLeuGlyGlyLysIleAlaT ::: ::: ::: CAGTTGCAATTCGGGTTGGGCTATGGCTCTTATGGAGGGCTCATGCTTAATGGAGGG	arGluTyrGlyLeuGl 	LysLeuGluThrGlyIleArgLeuAspSerGluTyrGlyLeuGlyGlyLysIleAlaTyr ::: ::: :::	319 1494
οý	320	AspTyrTyrAsnLe	AspTyrTyrAsnLeuPheAsnLysGlyTyr11eGlySerValValTrpAsp~	rileGlySerValva	lTrpAsp	336
Db	1495	AGCGAAAGGAATCI			AGCGAAAGGAATCTTTTGGCACAGGGCAAAGCATGAGCTTGTATGCTAACATTGCCACA	1554
ογ	337			-MetaspLysTyrGluThrThrLeuAlaAlaGly	rreuAlaAlaGly	347
qq	1555	GGGGGGGTAGATC	CTTATCCGGGCATGCC	SAAAAGGGGGGGGGC	GGGGGGGGTAGATCTTATCCGGGCATGCCAAAAGGGGCGGGGGGGG	1614
οy	348	IleSerG	-IleSerGlnProArg			352
qq	1615	TTGAGCTTGACTAA	ATCCAAGGATTTTGA	ACAGCTGGTATAGCTC	TTGAGCTTGACTAATCCAAGGATTTTTGACAGCTGGTATAGCTCTACGATCAATCTTAT	1674
δ	353	AsnTyrArg				355
Dp	1675	GCGGATTACAGGA1	TAAGCTACCAATACAT	rccaacaaggggggg	GCGGATTACAGGATAAGCTACCAATACATCCAACAAGGGGGGGG	1734
οy	356	[9	lyAsnTyrTrpThrSe	erAsnValSerTyrAs	-GlyasnTyrTrpThrSerasnValSerTyrAsnArgSerThrThrGln	371
Ор	1735	GGGCGCATGCTGG	GTAATAGAACCCATGI	GAGCTTAGGGTATAA	GGGCGCATGCTGGGTAATAGAACCCATGTGAGCTTAGGGTATAACTTGAATGTTACCAAA	1794
ολ	372	AsnLeuGluLysAr	rgAlaPheSerGlyGl	yileTrpTyrValAr	gAlaPheSerGlyGlyIleTrpTyrValArgAspArgAlaGlyIle	391
ор	1795	CTCCTT	GGTTTCAGCAGCCC	CTTA TACAACCG	CTACTATTCCTCTGTT	1842
ογ	392	Asp		AlaArgLe	-AlaArgLeuGlyAlaGluPheLeu	400
В	1843	AATGAAGTGGCCTC	CTCCAAGGCAATGTTC	cacacccccarccc	AATGAAGTGGCCTCTCCAAGGCAATGTTCCACACCCGCATCGGTGATTATCAACCGCTTA	1902

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1903 TCAGGGGGTAGAACTCCATTGGTTCCTGAAAGCTGTTCTAGTCCTGGAGCGATCACCACT 1962
                                                                          2137 TGGAACGGGTTAGGCGGGAATGTCCGTAACACCAAAGTTTATGGTAAATTCGCCGCTTAC 2196
                                                                                                                                                                                                                                                                                                                             2197 CACCATTTGCAAAATATTTATTGATAGATTTGATCGCTCGTTTTAAAACG-CAAGGGGG 2255
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| CGCCTCAATCACCTAAAGATGAGTTTGGCTTGTGGCTTGGAGGCGATGGGATTTTTAC 2405
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              2466 TITIGACTITGGITICTTAACCTITAAAACCCCAACTAGGGGGGGGGTTTCTTCTATAACGC 2525
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             2634 GGGCCTTTGGTGTTTGATTTTCCCTATAGCGTTTTTTCAACCAATGGGGCGATGGCAATGG 2693
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     2694 CAAAAAATGTAAAGGGCTGTGCTTTAACCCTAACATGAACGATTACACGCAACATTTTGA 2753
                                                                                                                                                                                                                                                                                                                                                          yTyrThrValAlaArgAspAsnAlaAsp-----ValProSerGlyLeuMetPheArgSe 505
                                                          ----- 425
                                                                                                                  426 LysArgGlnLeu------LeuAsnAsnValLeuHisProGluAsnGlyHisTyr 441
                                                                                                                                                                             442 LeuAspGlyLysIleGlyThrThrLeuGlyThrPheLeuSerSerThrAlaLeu-IleAr 461
                                                                                                                                                                                                                                        gThrSerAlaArgAlaGlyTyrPhePheThrProGlu------AsnLysLysLeuGl 478
                                                                                                                                                                                                                                                                                                                                                                                                                     rGlyGlyAlaSerSerValArgGlyTyrGluLeuAspSerIleGlyLeuAlaGlyProAs 525
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 .....ArgAlaLeuLeuValGlySerLeuGluTyrGlnLe 543
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            543 uProPheThrArgThrLeuSerGlyAlaValPheH1sAspMetGlyAspAlaAlaAlaAs 563
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   nPheLysArgMetLysLeuLysH1sGlySerGlyLeuGlyValArgTrpPheSerProLe 583
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         -----GlyHisSerAspLysLysIleArgTrpHi 602
401 AlaGluGlyArgLys-----IleProGlySerAspIleAspLeuGly------ 414
                                                                                                                                        yThr....phelleargGlyGlnAlaGl
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     2406 CCCTTCTACTGAATTGAGCTATGGGGTGTTAAAAGCGGCTAAAATGCGTTTAGCGTGGTT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                nGlySerValLeuProGlu-----
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The invention relates to a vaccine for preventing or treating infections by Helicobacter pylori. The vaccine contains at least one isolated the pylori polypeptide, or its fragments, in a cariter, where the carrier is a Salmonella, Vibrio cholerae or Shigella vector containing a nucleic acid encoding the H. pylori polypeptide. The vaccines induce humoral and cellular immune responses. The vaccines are used to treat or prevent infections by H. pylori. Sequences AAX75779 to AAX75837 represent nucleic acid sequences encoding H. pylori outer membrane polypeptides (OMPs) AAX17160 to AAX17218.
             H. pylori infection; humoral;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       ATCGCCGATAAGGGCTATGCGTTT-----1140
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Matches:
Conservative:
Mismatches:
Indels:
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             OMP; vaccine;
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                                                                                                                                                                                             (GENO-) GENOME THERAPEUTICS CORP
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174.00
33.67%
. 21.43%
                                                                                                                                                                                                                       Guild BC,
                         cellular immune response; ds.
             membrane polypeptide;
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                                                  Helicobacter pylori
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Best Local Similarity:
Query Match:
DB:
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28-OCT-1997;
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Pred. No.:
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1375 AAAAGGGTCAATAGCTCATTGATGATTGTTAGTGAGCGTAGAAGAGGGGCGCACCGGG 1434

AspargLeuGlnGlyAspargValProValLysValSerValThrGluValLysArgHis

300 LysLeuGluThrGlyIleArgLeuAspSerGluTyrGlyLeuGlyGlyLysIleAlaTyr 319

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1321 TCCGAAAATTCTTTGAGGCGTTTTAGGGTTTTTCTCT----AAAGTCAAGATTGAAGAA 1374

PheGlnGlnAlaLeuGluGlnAsnGlyHisTyrSerGlyAlaSerValGlnAlaAspPhe 279

260

9 9 9 9

2345 1842 2083 TTTAGTTCCTAT-----GCGACAATGTCTGGTTTGCCAAGCTCTGGCACGCTCAATTCT 2136 ||||| ::: ||| ||| ||| :::||| CTAT---ATCTTTAGGATATACTTGCCCTTAAACTCCACTTTCTACAT 2312 CGCTTCTACTGAATTGAGCTATGGGGTGTTAAAAGCGGCTAAAATGCGTTTAGCGTGGTT 2465 1963 TCACCAGAAATAAAAGGTATTTGGGATAGGGATTACCACACGCCTATCACCAGTTCTTTC 2022 2023 ACCCTTGATGTGAGCTATGACAACACCGATGATTATTATTTCCCTAGAAATGGGGTTATC 2082 TGGAACGGGTTAGGCGGGAATGTCCGTAACACCAAAGTTTATGGTAAATTCGCCGCTTAC 2196 CGGCTCAATCACACCTAAAGATGAGTTTGGCTTGTGGCTTGGAGGCGATGGGATTTTTAC 2405 TTGAGCTTGACTAATCCAAGGATTTTTGACAGCTGGTATAGCTCTACGATCAATGTTTAT 1674 GGGCGCATGCTGGGTAATAGAACCCATGTGAGCTTAGGGTATAACTTGAATGTTACCAAA 1794 AATGAAGTGGCCTCTCCAAGGCAATGTTCCACACCCGCATCGGTGATTATCAACCGCTTA 1902 487 531 yTyrThrValAlaArgAspAsnAlaAsp-----ValProSerGlyLeuMetPheArgSe 505 ---ArgAlaLeuLeuValGlySerLeuGluTyrGlnLe 543 -------GlyAsnTyrTrpThrSerAsnValSerTyrAsnArgSerThrThrGln 371 AsoLeuGluLysArgAlaPheSerGlyGlyIleTrpTyrValArgAspArgAlaGlyIle 391 392 Asp------401yAlaGluPheLeu 400 LeuAspGlyLysIleGlyThrThrLeuGlyThrPheLeuSerSerThrAlaLeu-IleAr 461 CTCCTT-----GGTTTCAGCCGCCCTTA---TACAACCGCTACTATTCCTCTTT ------AsnSerHisAlaThrMetLeuThrAlaSerTrp ----PhellelleArgGlyGlnAlaGl 505 rGlyGlyAlaSerSerValArgGlyTyrGluLeuAspSerIleGlyLeuAlaGlyProAs -----MetaspLysTyrGluThrThrLeuAlaGly---GCGGATTACAGGATAAGCTACCAATACATCCAACAAGGCGGGGCCTTTGGGGTGAATGTC LysArgGlnLeu------LeuAsnAsnValLeuHisProGluAsnGlyHisTyr gThrSerAlaArgAlaGlyTyrPhePheThrProGlu-----AsnLysLysLeuGl AspTyrTyrAsnLeuPheAsnLysGlyTyrIleGlySerValValTrpAsp-----AlaGluGlyArgLys----IleProGlySerAspIleAspLeuGly-2313 GGGGGCGTAACCACGGTGAGAGGCTTTAGG----nGlySerValLeuProGlu------------IleSerGlnProArg ---AsnTyrArg----478 yThr ---372 401 2346 1555 1615 1795 1843 442 461 2197 487 2256 525 2406 337 348 353 531 셤 g 셤 a 요 q ò 9 ò g ŏ qq ò ВP q qq g ò ò ò ò ò ò ò 8 g οy q à ò g ŏ ò ò

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Chlamydial infection; antigen; immunogen; vaccine; diagnosis; human respiratory disease; cardiovascular disease; atherosclerosis; coronary artery disease; carotid artery stenosis; myocardial infarction; cerebrovascular disease; aortic aneurysm; claudication; stroke; strain CWL029; open reading frame; ORF; gene; ds.
2466 TTTTGACTTTGGTTTCTTAACCTTTAAAACCCCAACTAGGGGGAGTTTCTTCTATAACGC 2525
                                                                                          CAAAAAATGTAAAGGGCTGTGCTTTAACCCTAACATGAACGATTACACGCAACATTTTGA 2753
                                          2634 GGGGCCTTTGGTGTTGATTTTCCCTATAGCGTTTTTTCAACCAATGGGGGCGATGGCAATGG
                                                                                                                                                                                ----GlyHisSerAspLysLysIleArgTrpHi
                         uProPheThrArgThrLeuSerGlyAlaValPheHisAspMetGlyAspAlaAlaAlaAs
                                                                          nPheLysArgMetLysLeuLysHisGlySerGlyLeuGlyValArgTrpPheSerProLe
                                                                                                                            uAlaPro-----PheSerPheAspIleAlaTyr--------
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                                                                                                                                                                                                                                                                                                                                                                                       Chlamydia pneumoniae cp6576 ORF DNA, SEQ ID NO:148,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       "Mature protein"
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/product= "cp6576"
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2000GB-0022583.
2000GB-0027549.
2000GB-0031706.
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2000GB-0017983.
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N-PSDB; ABB90599.
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18-AUG-2000;
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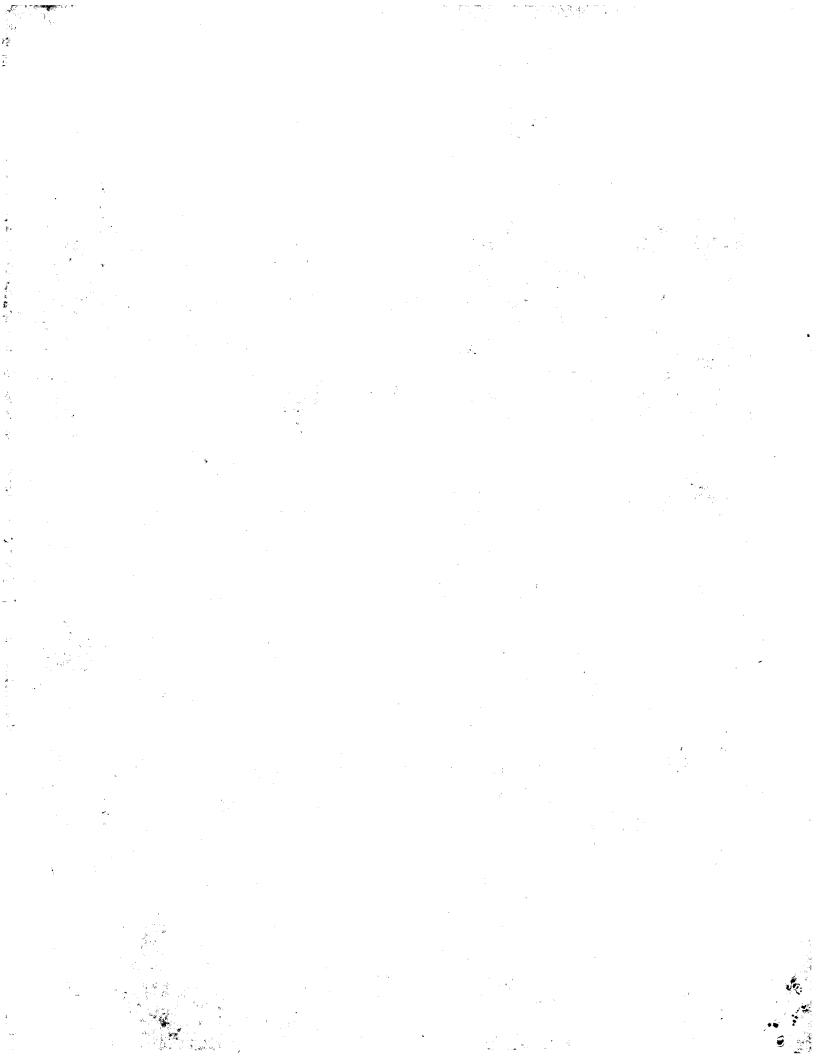
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pneumoniae (strain CWL029), and ABL91184-ABL91373 represent DNA encoding pneumoniae (strain CWL029), and ABL91184-ABL91373 represent DNA encoding them. The proteins are preddicted to be immunogenic and may therefore be useful in vaccine production and for diagnostic purposes. Chlamydia pneumoniae is a common cause of respiratory disease in humans, and is also involved in the development of cardiovascular diseases such as also involved in the development of cardiovascular diseases such as about a cornary artery disease, aortic aneurysm, myocardial infarction, cerebrovascular disease, aortic aneurysm, claudication and stroke. The proteins and nucleic acids of the invention may be used in vaccines and pharmaceutical compositions for the prevention or treatment of chlamydial infections, particularly Chlamydia pneumoniae, and the nucleic acids may be used in PCR, branched DNA probe assay or blotting techniques for determining Chlamydia pneumoniae gene expression. The present sequence represents a specifically claimed DNA which encodes a Chlamydia pneumoniae protein of specifically claimed DNA which encodes a Chlamydia pneumoniae protein of specifically claimed DNA which encodes a Chlamydia pneumoniae protein of
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medicament for treatment or prevention of infection due to Chlamydia, preferably Chlamydia pneumoniae, and for diagnostic purposes
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               SerGluIleLysAspMetValGluGluHisLeuProLeuIleThrGlnGln-----Gln 79
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               ProAlaAlaAspLeuSerGluAsnLysAlaAlaGlyPheAlaLeuPheLysAsnLysSer 41
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              397 AATGATCTCTTTGAACGAGAAAAA-----TTTCTT-----AAGGGTCTTGATGATCTA
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Conservative:
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                                                                        Claim 5; Page 113-114; 364pp; English.
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QQ	745	GCTGATGCTATAGTCAACTCTCACTATGACCTTGACGACAAA	786
ò	176	GluAsnSerLysThrSerValLeuGlyAlaVal	186
q	787	GGGAATATICTITACATGGATATTGATCGAGGGTCGCGATATACCTTAGGACACGTC	846
ò	187	ThrArgLysGlyTyrProLeu	193
g	847	CATATCCAAGGGTTTGAGGTTTTGCCAAAACGCCTTATAGAAAAGCAATCCCAAGTCGGC	906
ογ	193		193
g	907	CCCAATGATCTTTATTGCCCCGATAAAATATGGGATGGG	996
ò	194	AlaLysLeuGlyAsnThrArgAlaAlaValAsnProAsp	206
qq	196	TATGCAAAGTATGGCTACATCAATACCAATGTAGACGTTCTCTTCATCCCTCACGAACC	1026
ογ	207	ThralaThrValAspLeuAsnValValValAspSerGlyArgProlleAlaPheGlyAsp	226
qq	1027	CGCCCTATTTATGATGTAACTTATGAGGTGAAGGTCTCCTTATAAAGTTGGTTA	1086
δý	227	PheGlulleThrGlpThrGlnArgTyrProGluGlnIleValSerGlyLeuAlaArgPhe	246
g	1087	ATTAAAATTACTGGGAATACCCATACAAAATCTGACGTTATTTTACACGAAACCAGTCTC	1146
ογ	247	GlnProGlyThrProTyrAspLeuAspLeuLeuLeuAspPheGlnGlnAlaLeuGluGln	266
g	1147	TTCCCAGGAGATACATTCAATCGCTTAAAGCTAGAAGATACTGAGCAACGTTTAAGAAAT	1206
ý	267	AsnGlyHisTyrSerGlyAlaSerValGlnAla	27.7
qq	1207	ACAGGCTACTTCCAAAGCGTTAGTGTCTATACAGTTCGTTC	1266
٥٧	278	AspPheAspArgLeuGlnGlyAspArgValProValLysValSerValThrGlu	295
qq	1267		1326
ολ	296	ValLysArgHisLysLeuGluThrGlyIleArgLeuAsp	308
QQ	1327	GGCTTATTCTTAGGATTTAGTTCTCTTGACAATCTTTTGGAGGAATTGAACTATCTGAA	1386
ογ	309	SerGluTyrGlyLeuGlyGlyLysIleAlaTyrAspTyrTyrAsnLeuPheAsnLysGly	328
qq	1387	AGTAATTTTGATCTATTTGGAGCTAGAAATATATTTTCTAAAGGT	1431
ò	329	TyrIleGlySerVal	333
g	1432	TITCGTTGTCTAAGAGGGGGGGGAGAACATCTTAAAAAGCCAACTTGGGGGACAAA	1491
Qy Dp	334	ValTrpAspMetAspLysTyrGluThrThrLeuAlaAlaGlyIleSerGlnProArgAsn	353 1527
ογ	354	TyrArgGlyAsnTyrTrpThrSerAsnValSerTyrAsnArgSerThr	369
Q	1528	::: TTTCTAAACACTCCTTGGATTTAGGAATTAGATTAGATAAATCAATTAACAGAGGATTA	1587
δý	370	ThrGlnAsnLeuGluLysArgAlaPheSerGlyGlyIleTrpTyrValArgAsp	387
qq	1588	TCTAAAGATTATGCTGTCCAAACCTATGGCGGGAACGTCAGCACGTATATCTTGAAC	1647
ò	388	ArgAlaGlylleAspAlaArgLeuGlyAlaGluPheLeuAlaGluGlyArg	404
q	1648	GAACACCTGAAATACGGTCTATTTTATCGAGGAAGTCAAACGAGTTTACATGAAAAACGT	1707
οy	405	LysIleProGlySerAspIleAspLeuGlyAsnSerHisAlaThrMetLeuThrAla	423
QQ	1708	AAGTTCCTCCTAGGGCCAAATATAGACAGCAATAAAGGATTTGTCTCTGCT	1758
ò	424	SerTrpLysArgGlnLeuLeuAsnAsnValLeuHisProGluAsnGlyHisTyrLeuAsp	443
q	1759	GCAGGTGTCAACTTGAATTACGATTCTGTAGATAGTCCTAG-AACTCCAACTACAGGGAT	1817

gThrSe 463	1800	sLysLe 477	AAAACT 1907	gAspAs 494	TAGCAA 1967	rServa 511	TACAGT 2027	nGlySe 527	GGGAGG 2087	eThrAr 547	CATCAG 2135	пРћељу 565	AGAGTA 2195	62:	247
ralaLeuIleAr 			CTCTATCTATAG	rThrValAlaAr	TATTAAACCCTA	rGlyGlyAlaSe	AGGTGGAGAGAC	AlaGlyProAs	racagaaccec	rGlnLeuProP	rcaataccete	pAlaAlaAlaAs	rerccertrac?	yValArgTrp	CTGCGCTTC 2
444 GlyLysIleGlyThrThrLeuGlyThrPhe-LeuSerSerThrAlaLeuIleArgThrSe 463	TTGGGAGGAAC	463 rAlaArgAlaGlyTyrPhePheThrProGluAsnLysLysLe 477	TCTTTAAACAG	477 uGlyThrPheIleIleArgGlyGlnAlaGlyTyrThrValAlaArgAspAs 494	GAAGCTCAATT	MetPheArgSe	TACTACAGCTGAAGGAGTTCCTGTCAGTGAGCGCTTCTTCCTAGGTGGAGGACTACAGT 202	lArgGlyTyrGluLeuAspSerIleGlyLeuAlaGlyProAsnGlySe 527	AAATACTCTGC	rValLeuProGluArgAlaLeuLeuValGlySerLeuGluTyrGlnLeuProPheThrAr 547	TCAGAAGAGTT	547 gThrLeuSerGlyAlaValPheHisAspMetGlyAspAlaAlaAlaAsnPheLy 565	GACTCAGGTTT	SerGlyLeuGl	2196 TAAGATTTCGTTAAAAGATCTACGTAGTAGTGCTGCGATTTGGTCTGCGCTTC 2247
uGlyThrPhe-	AGGTTTCTGGT	heThrProGlu	TTACAAAACTC	lelleArgGly	AAATCAAAGGG	roSerGlyLeu	ii ctgtcagtgag	erllegly	TTATCGGTCCA	euLeuValGly	TCCTTATT	laValPheHis	TTGTATTCTTA	HisGly	TACGTAGTAGT
GlyThrThrLe	GGTGACTTTTG	aGlyTyrPheP	TATCATT	-GlyThrPheI	AGGTATTTGA	AspValP	TGAAGGAGTTC	rGluLeuAspS	TAAATCCTTTA	oGluArgAlaL	TELLE	rLeuSerGlyA	TATTAGIGCCT	sreurys	GTTAAAAGATC
GlyLysile	TCGCGGGGG	rAlaArgAl		n	TACGCGTAA	494 nAla	TACTACAGO	lArgGlyTy				gTh	 ACAACCTAA	SArgMetLy	TAAGATTTC
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BASB040; bacterial disease; respiratory tract infection; bacteraemia; meningitis; cancer; autoimmune disease.
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The present sequence is a putative version of the Neisscria meningitidis strain ATCC13090 BASB040 protein sequence. This protein is similar to the DIS outer membrane protein of the bacterium. The protein, its gene, antibodies, antagonists and agonists can be used to diagnose and treat bacterial diseases such as those leading to upper respiratory tract infections, bacteraemia and meningitis. In addition, they can be
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Novel BASB040 polypeptides of Neisseria meningitidis useful for
diagnostic, prophylactic and therapeutic purposes against microbial
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       AYTVHITPGPRTKIANVGVAILGDILSDGNLAEYYRNALENWQQPVGSDFDQDSWENSKT
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          tract infections, bacteraemia and meningitis. In addition, they used in vaccines for use against cancer and autoimmune diseases
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Length 609;
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           100.0%; Score 3173; DB 21;
100.0%; Pred. No. 8.2e-252;
11ve 0; Mismatches 0;
                                                                                                                                                                                                                                                                                                                                                                                                                                                   diseases comprise a specific amino acid sequence
neningitis; cancer; autoimmune disease
                                                                                                                                                                                                                                                       (SMIK ) SMITHKLINE BEECHAM BIOLOGICALS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Claim 4; Page 60-61; 98pp; English
                                                                                                                                                                   99WO-EP09560
                                                                                                                                                                                                             98GB-0026886
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                                       Neisseria meningitidis
                                                                                                                                                                                                                                                                                                                                         2000-423426/36.
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Matches 609; Conserv
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                                                                               40200034480-A1
                                                                                                                                                                   32-DEC-1999;
                                                                                                                         15-JUN-2000
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BASB040; bacterial disease; respiratory tract infection; bacteraemia;

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Query Match
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    represent novel Neisseria meniggits and N. gonorrheae polynuclectides and polypeptides. AA254537 to AA254576 and AA254616 to AA255473 represent PCR primers used in the exemplification of the present invention. The polypeptides, the polynuclectides, antibodies and compositions of the invention can be used as vaccines, as diagnostic reagents, and as manufacture of medicaments for treating or preventing infection due to Neisserial bacteria (or menigits and septicaemia), to detect the presence of Neisseria bacteria, or to raise antibodies. They may also be used to screen for agonists or antagonists, which may themselves have use as antibacterial agents. The polynucleotides of the invention may also be used in gene therapy protocols.
                                                                                                                                                                                                                              Neisseria meningitidis; Neisseria gonorrheae; antigen; vaccine; antigenic; diagnosis; immunogenic; infection; meningitis; septicaemia;
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                    481 IIRGQAGYTVARDNADVPSGLMFRSGGASSVRGYELDSIGLAGPNGSVLPERALLVGSLE 540
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             AAZ53015 to AAZ54536, AA254577 to AAZ54615, and AAY74253 to AAY75941
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               V, Mora M;
, Scarselli
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Novel Neisserial polypeptides predicted to be useful antigens for vaccines and diagnostics
                                                                                                                                                                                                          Neisseria meningitidis ORF 286 protein sequence SEQ ID NO:1198
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Masignani V
Scalato E,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Hickey E,
Ratti G,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Fraser C, Galeotti C, Grandi G,
Petersen J, Pizza M, Rappuoli R,
Tettelin H, Venter JC;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Claim 2; Page 669; 1453pp; English.
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                                                                                                                                         AAY74862 standard; Protein; 615
                                                                                                                                                                                                                                                                                                                                                                                            980S-0099062.
980S-0103749.
980S-0103794.
980S-0103796.
990S-0121528.
                                                                                                                                                                                                                                                    antibacterial; gene therapy.
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                                                                                                                                                                                                                                                                          Neisseria meningitidis
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WHISLGTRF 609
                                                                WHISLGTRF 609
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09-OCT-1998;
25-FEB-1999;
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31-JUL-1998
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Neisseria meningitidis; Neisseria gonorrheae; antigen; vaccine; antigenic; diagnosis; immunogenic; infection; meningitis; septicaemia; antibacterial; gene therapy.
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                                                                                                                                                                           121 AYTVHITPGPRTKIANVGVAILGDILSDGNLAEYYRNALENWQQPVGSDFDQDSWENSKT 180
                                                                                                                 DSEIKDMVEEHLPLITQQQEEVLDKEQTGFLAEEAPDNVKTMLRSKGYFSSKVSLTEKDG 120
                              Gaps
                                                         1 MMIKPTALLLPALFFFPHAYAPAADLSENKAAGFALFKNKSPDTESVKLKPKFPVRIDTQ 60
                                                                          7 MMIKPTALLLPALFFFPHAYAPAADLSENKAAGFALFKNKSPDTESVKLKPKFPVRIDTQ 66
                                                                                                                                                                                                                                               SGLARFQPGTPYDLDLLLDFQQALEQNGHYSGASVQADFDRLQGDRVPVKVSVTEVKRHK
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                               ö
Length 615;
                              Indels
99.4%; Score 3153; DB 21; 99.3%; Pred. No. 3.7e-250; ive 1; Mismatches 3;
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98US-0094869
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                            Matches 605; Conservative
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                Similarity
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31-JUL-1998;
                  Best Local
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Neisseria meningitidis
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                                                                                                      WHISLGTRF
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                                                                                                                                                                                                                                                                                                                                                                                                                                                  Gaps
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                                                                                                        Scarselli
                                                                                              Mora M;
                                                                                                                                                                                                                                                                                                                                                                                                              MMIKPTALLLPALFFPHAYAPAADLSENKAAGFALFKNKSPDTESVKLKPKFPVRIDTQ
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                                                                                                                                                                for
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                                                                                                                                                               Novel Neisserial polypeptides predicted to be useful antigens
                                                                                                                                                                                                                                                                                                                                                                Length 615;
                                                                                              Masignani V,
Scalato E, S
                                                                                                                                                                                                                                                                                                                                                                                   Indels
                                                                                                                                                                                                                                                                                                                                                              Score 3136; DB 21;
Pred. No. 9.1e-249;
3; Mismatches 5;
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                                                                                              Hickey
                                                                                              Grandi G,
Rappuoli R,
                                                                                                                                                                                         Claim 2; Page 667; 1453pp; English
                                                                                                     Rappuoli
                                                                                                                                                                                                                                                                                                                                                                98.8%;
98.7%;
98US-0098994.
98US-0099062.
98US-0103749.
98US-0103794.
99US-0121528.
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                                                                           INST GENOMIC RES
                                                                                                                                                                          vaccines and diagnostics
                                                                                                                 Venter JC;
                                                                                            Galeott1 C,
                                                                                                      Pizza M,
                                                                                                                                 WPI; 2000-062150/05.
N-PSDB; AAZ53623.
                                                                   CORP.
                                                                                                                                                                                                                                                                                                                                              615 AA;
                                                                  (CHIR ) CHIRON
                   09-OCT-1998;
09-OCT-1998;
09-OCT-1998;
                                                25-FEB-1999;
                                                                                                       Petersen J,
Tettelin H,
                                                                                                                                                                                                                                                                                                                                            Sequence
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Best Local Si
Matches 601;
                                                                                              Fraser C,
                                                                            GENO-)
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                                                                                                                                                                            909
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                BASB040; bacterial disease; respiratory tract infection; bacteraemia; meningitis; cancer; autoimmune disease.
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              143 GDILSDGNLAEYYRNALENWQQPVGSDFDQDSWENSKTSVLGAVTRKGYPLAKLGNTRAA 202
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     82
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                                                                                                                                                1 AADLSENKAAGFALFKNKSPDTESVKLKPKFPVLIDTQDSEIKDMVEEHLPLITQQQEEV
                            YQLPETRILSGAVFHDMGDAAANFKRMKLKHGSGLGVRWFSPLAPFSFDIAYGHSDKKIR
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11RGQAGYTVARDNADVPSGLMFRSGGASSVRGYELDS1GLAGPNGSVLPERALLVGSLE
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Neisseria meningitidis BASB040 putative protein sequence
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Pred. No. 3.5e-239;
3; Mismatches 5;
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98.6%;
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Matches 579; Conservative
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23..236
/note= "N
237..578
                                                                                                                       522 AA;
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Scalato E, Scarselli M;
                                                                                                                                                                                                                                                                       Neisseria meningitidis; Neisseria gonorrheae; antigen; vaccine;
antigenic; diagnosis; immunogenic; infection; meningitis; septicaemia;
                                                                                                                                                       PRSGGASSVRGYELDSIGLAGPNGSVLPERALLVGSLEYQLPFTRTLSGAVFHDMGDAAA 562
                                                                     NLFNKGYIGSVVWDMDKYETTLAAGISQPRNYRGNYWTSNVSYNRSTTQNLEKRAFSGGI 382
                        ALEQNGHYSCASVQADFDRLQGDRVPVKVSVTEVKRHKLETGIRLDSEYGLGGKIAYDYY
                                                                                             WYVRDRAGIDARLGAEFLAEGRKIPGSDIDLGNSHATMLTASWKRQLLNNVLHPENGHYL
                                                                                                                       DGKIGTTLGTFLSSTALIRTSARAGYFFTPENKKLGTF11RGQAGYTVARDNADVPSGLM
                                                                                                                                                                                                                                                           Neisseria gonorrheae ORF 286 protein sequence SEQ ID NO:1194
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Petersen J, Pizza M, Rappuoli R,
Tettelin H, Venter JC;
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                                                                                                                                                                                                                     AAY74860 standard; Protein; 522
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98US-0094869-
98US-0099062.
98US-0103749.
98US-0103794.
99US-0103796.
                                                                                                                                                                                                                                                                                    antibacterial; gene therapy
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N-PSDB; AAZ53622.
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31-JUL-1998;
02-SEP-1998;
09-OCT-1998;
09-OCT-1998;
09-OCT-1998;
25-FEB-1999;
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AAE53015 to AAE54536, AAE54577 to AAE24615, and AAY74253 to AAY75941 represent novel Neisseria meningitis and N. gonorrheae polynucleotides and polypeptides. AAE54577 to AAE54576 and AAE54616 to AAE5473 represent PCR primers used in the exemplification of the present invention. The polypeptides, the polynucleotides, antibodies and compositions of the invention can be used as vaccines, as diagnostic reagents, and as immunogenic compositions. The polypeptides can be used in the manufacture of medicaments for treating or preventing infection due to Neisserial bacteria (e.g. meningitis and septicaemia), to detect the presence of Neisseria bacteria, or to raise antibodies. They may also be used to screen for agonists or antagonists, which may themselves have use as antibacterial agents. The polynucleotides of the invention may also be used in gene therapy protocols.
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        SVLGAVTRKGYPLAKLGNTRAAVNPDTATVDLNVVVDSGRPIAFGDFEITGTQRYPEQIV 240
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Novel Neisserial polypeptides predicted to be useful antigens for vaccines and diagnostics
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/label- Signal_peptide
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/label- Mature_protein
                                                                                                       English
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                                                                                                       Page 666-667; 1453pp;
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DYYNLFNKGYIGSVVWDMDKYETTLAAGISQPRNYRGNYWTS------NVSYNRST 369
                                            325 NYYYDFAVGWEGEKENDTNTRVLTLSA-----LRYWNNAHGWOYFGGLRMRYDSFT 375
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         1..20
/label= Signal_peptide
21..576
/label= Mature_protein
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used for diagnosing
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570 FYIGLGT 576
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                                                                                                                                                                                                                                                                                                                    The present sequence is that of outer membrane protein BASB067 of Haemophilus influenzae strain Rd KW20. BASB067 is a surface expressed protein that is recognised by the immune system. It shows 23% identity to the protective surface antigen DI5 of H. influenzae and has a similar secondary structure. Its hybridizational domain is predicted to contain a mixture of alpha-helix and beta-strands, and could be used as a vaccine antigen. The cterminal domain is predicted to form a beta-barrel composed of anti-parallel, amphipathic beta-strands. The external loops of the beta-barrels of integral outer membrane proteins frequently contain immunodominant B-cell epitopes, making the C-terminal contain immunodominant B-cell epitopes, making the C-terminal contain immunodominant B-cell epitopes, making the C-terminal invention relates to recombinant materials and methods for the production of BASB067 polypeptides and polyunclectides, for use relates to methods for using such polypeptides and polyunclectides in the prevention and treatment of microbial diseases, in diagostic assays for detecting diseases associated with microbial infections, and assays for detecting expression or activity of BASB067 polypeptides. Can be used to treat humans with H. influenzae disease.
                                                                                                                                                                                                                                                    polypeptide and polynucleotide from Haemophilus influenzae are diagnosing and treating H. influenzae infections -
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              297
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                DYLNNILNIKSGDPYLMNNLSDLTSDFPSSNWFSSVLVQPNVNH-KSKTVDVEIILYPRK 264
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  EIKDMVEEHLPLITQQQEEVLDKEQTGFLAEEAPDNVKTMLRSKGYFSSKVSLTEKD--- 119
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            --GAYTVHITPGPRTKIANVGVAILGDILSDGNLAEYYRNALENWQOPVGSDFDQDSWEN 177
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        92 KRDLLIAHVTPGEPTKIAGTDVQIEGEAAQDENF----NALRKNLPKDGVLVEHQTYDD 146
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     178 SKTSVLGAVTRKGYPLAKLGNTRAAVNPDTATVDLNVVVDSGRPIAFGDFEITGTQRYPE 237
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               147 YKTAISRLALNRGYFDGNFKISRLEISPETHQAWWRMLFDSGVRYHYGNITFSHSQ-IRD 205
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          3 IKPTALLLPALFFFPHAYAPAADLSENKAAGFALFKNKSPDTESVKLKPKFPVRIDTQDS 62
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       6 LKLTALFL-ALSCFPAFAEQTVDIEVQGIRGFRAVRNTD-------LNVNLINK 51
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                11.8%; Score 374; DB 21; Length 578; 22.9%; Pred. No. 7.1e-22; ive 93; Mismatches 263; Indels 158;
/note= "C-terminal domain"
                                                                                                                                                 (SMIK ) SMITHKLINE BEECHAM BIOLOGICALS.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        RHKLETGIRLDSEYGLGGKIAY-----
                                                                                                                                                                                                                                                                                             Claim 1; Page 78-80; 87pp; English
                                                                                     04-FEB-2000; 2000WO-EP00887
                                                                                                                    99GB-0002880
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             153; Conservative
                                                                                                                                                                              Thonnard J;
                                                                                                                                                                                                        WPI; 2000-515059/46.
N-PSDB; AAA50269.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Similarity
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   578 AA;
                             WO200047737-A1
                                                                                                                    09-FEB-1999;
                                                          17-AUG-2000
                                                                                                                                                                            Ruelle J,
                                                                                                                                                                                                                                                                     for
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Sequence
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Query Match
Best Local :
                                                                                                                                                                                                                                                      BASB067
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Matches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              52
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and polynucleotide from Haemophilus influenzae are and treating ${\rm H.\ Influenzae}$ infections -370 TQNLEKRAF----SGGIWYVRDRAGIDARLGAEFLAEGRKIPGSDIDLGNSHATMLTASW 425 376 QADITDKTLLLYPTVGFTRTRLRGGSFATWG-----DVQKI---TFDLS------ 416 KR-----VARA 449 FTRTLSGAVFHDMGDAAANFKRMKLKHGSGLGVRWFSPLAPFSFDIAYGHSD----KKIR 600 KRQLLNNVLHPENGHYLDGKIGTTLGTFLSSTALIRTSARAGYFFT-PENKKLGTFIIRG 484 Haemophilus influenzae non-typeable (NtH1) strain 289. BASB067 Is a surface expressed protein that is recognised by the immune system. It shows homology to the protective surface antigen D15 of H. influenzae and has a similar secondary structure. Its N-terminal domain is predicted to contain a mixture of alpha-helix QAGYTVARDNADVPSGLMFRSGGASSVRGYELDSIGLAGPNGSVLPERALLVGSLEYQLP the present sequence is that of outer membrane protein BASB067 of BASB067; outer membrane protein; antigen; vaccine; antiblotic; antibacterial; screening; infection; diagnosis; therapy. Haemophilus influenza ntHi strain 289 BASB067 protein.

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15;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     GNFKISKLEISPETHQAWWRALFDSGVRYHYGNITFSHSQ-IRDDYLNNIKNIKSGDPYL 219
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          LDLLLDFQQALEQNGHYSGASVQADFDRLQGDRVPVKVSVTEVKRHKLETGIRLDSEYGL 313
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        GGKIAY-----DYYNLFNKGYIGSVVW 335
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                GAEFLAEGRKIPGSDIDLGNSHATMLTASWKRQLLNNVLHPENGHYLDGKIGTTLGT--- 452
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         GLMFRSGGASSVRGYELDSIGLAGPNGSVLPERALLVGSLEYQLPFTRTLSGAVFHDMGD 559
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                     QEEVLDKEQTGFLAEEAPDNVKTMLRSKGYFSSKVSLTEKD-----GAYTVHITPGPRTK 133
                                                                                                                                                                                                                                                                                                                                                                                                                                                     KEEMDGSERYQHLVTKAVDR---GLRVFGYYESSVRFERKQRQGKRDLLIAHVTPGEPTK 105
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          IANVGVAILGDILSDGNLAEYYRNALENWQQPVGSDFDQDSWENSKTSVLGAVTRKGYPL 193
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             106 IAGTDVQIEGEAAQDENF----DALRKNLPKEGVLVEHQTYDDYKTAISRLALNRGYFD 160
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            DMDKYETTLAAGISQPRNYRGNYWTSNVSYNRSTTQNLEKRAFSGGIWYVRDRAGIDARL 395
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                339 DTNTRVLTLSA------LRYW------NNAHGWOYFGGL-----RTRYDSFT 373
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    374 QADI------TDKTLL------LYPTVGFTRTRLRGGSFATWGD 405
and beta-strands, and could be used as a vaccine antigen. The anti-parallel, amphipathic beta-strands. The external loops of the beta-barrels of integral outer membrane proteins frequently contain immunodominant B-cell epitopes, making the C-terminal domain of BASB067 a strong candidate vaccine antigen. The production relates to recombinant materials and methods for the production of BASB067 polypeptides and polynucleotides, for use especially in therapeutic and prophylactic vaccines. It also relates to methods for using such polypeptides and polynucleotides in the prevention and treatment of microbial diseases, in diagostic assays for detecting diseases associated with microbial infections,
                                                                                                                                                                                                                   and assays for detecting expression or activity of BASB067 polypeptides or polynucleotides. Antibodies raised against the mature portion of this BASB067 polypeptide can be used to treat
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               194 AKLGNTRAAVNPDTATVDLNVVVDSGRPIAFGDFEITGTQRYPEQIVSGLARFQPGTPYD
                                                                                                                                                                                                                                                                                                                                                                                    Indels 129;
                                                                                                                                                                                                                                                                                                                                                 Length 576;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     AAANFKRMKLKHGSGLGVRWFSPLAPFSFDIAYGHSD----KKIRWHISLGT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Amino acid sequence of outer membrane protein (omp) 85.
                                                                                                                                                                                                                                                                                                                                                 DB 21;
                                                                                                                                                                                                                                                                                                                                             ; Score 355.5; DB 21;
; Pred. No. 2.3e-20;
87; Mismatches 238;
                                                                                                                                                                                                                                                                          humans with H. influenzae disease.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             AAY84946 standard; Protein; 792
                                                                                                                                                                                                                                                                                                                                               11.2%;
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                                                                                                                                                                                                                                                                                                                                                                Best Local Similarity 23,3%
Matches 138; Conservative
                                                                                                                                                                                                                                                                                                            576 AA;
                                                                                                                                                                                                                                                                                                              Sequence
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                AAY84946;
                                                                                                                                                                                                                                                                                                                                               Query Match
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The present sequence represents an outer membrane protein (omp) 85 of Neisseria gonorrhoeae. The omp polypeptides and polynucleotides are useful in compositions for use in the prevention, treatment and diagnosis of non-symptomatic gonococcal infection or meningococcal infection and symptomatic disease. They are also useful for the detection of hybridisation complexes. Antigens and antibodies specific omp proteins also provide diagnostic, therapeutic and prophylactic compositions for the treatment or prevention of the infections described above. The antibodies are useful for inducing a protective immune response in humans or animals with N. gonorrhoeae, N. meningitidis, or other Neisseria species. The proteins, antibodies and polynucleotide sequences of the present invention may also be used in the screening and development of chemical compounds such as drugs or vaccines.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              28;
               Outer membrane protein; omp85; gonococcal infection; symptomatic disease; meningococcal infection; protective immune response; vaccine.
                                                                                                                                                                                                                                                                                                                                                                                                                                                            New isolated outer membrane protein 85 of Neisseria gonorrhoeae and N. meningitidis useful for vaccine, therapeutic and diagnostic compositions for gonococcal or meningococcal infections
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            315
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 DNVKTMLRSKGYF----SSKVSLTEKDGAYTVHIT--PGPRTKIANVGVAILGDILSDG 149
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              275 DINEVPKAELEKLLIMKPGKWYE------ROOMTAVLGEIONRMGSAGYAYSEI- 322
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       323 SVQPLPNAGTKTVDFVLHIEPGRKIYVNEIHITGNNKTRDEVVRRELRQMESAPYDTSKL 382
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          ----RSTTQNLEKRAFSGG-----IWYVRDRAGIDA-----RLGAEFLAE 402
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           150 NLAEYYRNALE-----NWQQPVGSDFDQDSWENSKTSVLGAVTRK----GYPLAKLG 197
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     EKVTDFYQNNGYFDFRILDTDIQTNEDKTRQTIKITVHEGGRFRWGKVSI-----EG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   198 NTRAAVNPDTATVDLNVVDSGRPIAFGDFEITGTQRYPEQIVSGLARFQPGTPYDLDLL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            LDFQQALEQNGHYSGASVQADFDRLQG--DRVPVKVSVTEVKRHKLETGIRLDSEYGLGG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   KIAYDYYNLFNKGYIGSVVWDMDKYETTLAAGISQPRNYRGNYWTS---NVSYN-----
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Indels 149;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           DB 21; Length 792;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         8.2%; Score 260.5; DB 21;
22.6%; Pred. No. 2.4e-12;
ive 86; Mismatches 242;
                                                                                                                                          /note- "signal peptide"
                                                                                                       Location/Qualifiers
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Claim 1; Fig 2; 98pp; English.
                                                                                                                                                                                                                                                        98WO-US22352.
                                                                                                                                                                                                                                                                                            98WO-US22352.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Local Similarity 22.6
nes 139; Conservative
                                                                       Neisseria gonorrheae.
                                                                                                                                                                                                                                                                                                                                   (UYMO-) UNIV MONTANA.
                                                                                                                                                                                                                                                                                                                                                                        Judd RC, Manning SD;
                                                                                                                                                                                                                                                                                                                                                                                                        WPI; 2000-339694/29.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      792 AA;
                                                                                                                                                                                                                                                                                                                                                                                                                             N-PSDB; AAA15155
                                                                                                                                                                                 WO200023595-A1.
                                                                                                                                                                                                                                                        22-OCT-1998;
                                                                                                                                                                                                                                                                                            22-OCT-1998;
                                                                                                                                                                                                                     27-APR-2000
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                                                                                                         Key
Peptide
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us-09-857-669-2.rag

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The sequence represents a Neisseria meningitidis serogroup A 85 kDa antigenic protein. Neisseria meningitidis colonises the pharynx, causing meningitis and, occasionally, septicaemia in the absence of meningitis. This antigenic protein is useful in the manufacture of a medicament for treating or preventing infection due to Neisseria bacteria, such as meningitis and septicaemia. It is also useful as a diagnostic reagent for
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Novel 85 kDa antigen from Nelsserla meningitidis and Neisserla
gonorrhoeae, useful in the manufacture of a medicament for treating and
preventing Neisserlal bacterla infection -
                                                                                                                                                                                                                                                                                                                                                                                                                                                                      B antigen; pharynx; meningitis; septicaemia; mammalian cell; infection; baculovirus; yeast.
                                                                                                                629
                                                                                                                                                            GRKIPGSDIDLGNSHATML---TASWKRQLLNNVLHPENGHYLDGKIGTTLGTFLSSTAL 459
                                                                                                                                                                                                 ------AAANFKRM-------KLKHGSGLGVRWFSPLAPFSFDIAY----G 593
495 DPRKASTSVKQYKTTTAGGGVRMGIPVTEYDRVNFGLAAEHLTVNTYNKAPKRYADFIKQ 554
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    "Mature N. meningitidis serogroup A antigen"
                                                                                                    555 YGKTDGAD----GSFKGLLYKGTVGWGRNKTDSALWPTRG-YLTG-----VNAEI
                                                                                  IRTSARACYPFTPENK-----KLGTFIIRGQAGYTVARDNA-DVPSGLMFRSGGASSV
                                                                                                                                         RGYELDSIGLAGPN----GSVLP----ERALLVGSLEYQLP---FTRTLSGAVFHDMGD
                                                                                                                                                                                                                                                                                                                                                                                                                                           Neisseria meningitidis serogroup A antigenic protein
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22..792
/note= "Mature N. menin
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Location/Qualifiers
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                                                                                                                                                                                                                                                                                                                                                        AAU03958 standard; Protein; 792 AA.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Claim 1; Page 66-68; 92pp; English.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            (CHIR-) CHIRON SPA.
(STAT-) STATENS INST FOLKEHELSE.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       28-NOV-2000; 2000WO-IB01851.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                09-MAR-2000; 2000GB-0005698
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   99GB-0028197
                                                                                                                                                                                                                                                                                                                                                                                                                 (first entry)
                                                                                                                                                                                                                                                          594 HSDKKIRWHISLGTRF 609
                                                                                                                                                                                                                                                                                    PEDEIQRFQFQLGTTF 792
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  meningitidis
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Sluliani MM, Pizza M,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 2001-381289/40.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 N-PSDB; AAS07278
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                                                                                                                                                                                                                                                                                                                                                                                                               23-OCT-2001
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Serogroup
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Neisseria
                                                                                                                                                                                                                                                                                                                                                                                     AAU03958;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Peptide
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Protein
                                                                                                                                                                                                                                                                                                                              RESULT 10
AAU03958
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28;
detecting the presence of Neisseria bacteria or antibodies raised against Neisseria, and as a reagent for raising the antibodies. The Neisserial noutlochide sequences can be expressed in a variety of different expression systems, for example, mammalian cells, baculoviruses, plants, bacteria and yeast.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   629
                                                                                                                                                                                                                                                      EKVIDFYQNNGYFDFRILDTDIQTNEDKTRQTIKITVHEGGRFRWGKVSI-----EG 274
                                                                                                                                                                                                                                                                                                                                                                                                                             258 LDFQQALEQNGHYSGASVQADFDRLQG--DRVPVKVSVTEVKRHKLETGIRLDSEYGLGG 315
                                                                                                                                                                                                                                                                                                                                                                                                                                                         ORSKERVELLGYFD--NVQFDAVPLAGTPDKVDLNMSLTERSTGSLDLSAGWVQDTGLVM 440
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           316 KIAYDYYNLFNKGYIGSVVWDMDKYETTLAAGISQPRNYRCNYWTS---NVSYN----- 366
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          ----RSTTQNLEKRAFSGG-----IWYVRDRAGIDA------RLGAEFLAE 402
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        GRKIPGSDIDLGNSHATML---TASWKRQLLNNVLHPENGHYLDGKIGTTLGTFLSSTAL 459
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       511
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         ------AAANFKRM------ KLKHGSGLGVRWFSPLAPFSFDIAY----G 593
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     DNVKTMLRSKGYF----SSKVSLTEKDGAYTVHIT--PGPRTKIANVCVAILGDILSDG 149
                                                                                                                                                                                                                                                                                                NLAEYYRNALE-----GYPLAKLG 197
                                                                                                                                                                                                                                                                                                                              DINEVPRAELEKLLTMKPGKWYE------ROOMTAVLGEIONRMGSAGYAYSEI- 322
                                                                                                                                                                                                                                                                                                                                                              NTRAAVNPDTATVDLNVVVDSGRPIAFGDFEITGTQRYPEQIVSGLARFQPGTPYDLDLL 257
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      DPRKASTSVKOYKTTTAGGGVRMGIPVTEYDRVNFGLAAEHLTVNTYNKAPKRYADFIRK 554
                                                                                                                                                                                                    Gaps
                                                                                                                                                                                                                                                                                                                                                                                   SOOPLPNAGTKTVDFVLHIEPGRKIYVNEIHITGNNKTRDEVVRRELRQMESAPYDTSKL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                SAGVSQDNLFGTG--KSAALRASRSKTTLNGSLS----FTDPYFTADGVSLGYDIYGKAF
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      RGYELDSIGLAGPN----GSVLP----ERALLVGSLEYQLP---FTRTLSGAVFHDMGD
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Serogroup B protein; outer membrane protein; Neisserial infection;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      555 YGKTDGAD----GSFKGLLYKGTVGWGRNKTDSASWPTRG-YLTG-----VNAEI
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     IRTSARAGYFFTPENK ----KLGTF11RGQAGYTVARDNA-DVPSGLMFRSGGASSV
                                                                                                                                                                                                   Indels 149;
                                                                                   Note: There are two versions of this sequence displayed in the specification (see AAU04451).
                                                                                                                                                                     Length 792;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Amino acid sequence of a Neisseria gonorrheae protein.
                                                                                                                                                                   Score 256.5; DB 22;
Pred. No. 5.1e-12;
; Mismatches 243;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              AA.
                                                                                                                                                                                               .98
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                                                                                                                                                                   8.18;
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                                                                                                                                                                                                   Conservative
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Neisseria gonorrheae.
                                                                                                                                                                                  Similarity
                                                                                                                                   792 AA;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         17-SEP-2001
                                                                                                                                                                                                   Matches 138;
                                                                                                                                       Sequence
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            AAB84745;
                                                                                                                                                                   Query Match
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AAB84745
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Rappuoli R,
                                                                                                                                                                                                                                                                                                                  594 HSDKKIRWHISLGTRF
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       immune response.
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 The present sequence represents a Neisseria gonorrheae protein. The protein is used to produce the compositions of the invention. The specification describes a composition, comprising a Neisseria meningitidis serogroup B outer membrane preparation and an immunogenic component. The immunogenic component is protein disclosed in W099/57280, W099/35644, W099/586791, W099/58273, W099/582733, W099/
                                                                                                                                                                                                                                                                                                                                                                                                                         Composition for treating or preventing infection to, detecting, or for raising antibodies against Neisserial bacteria, comprises an N-meningitidis serogroup B outer membrane preparation and an immunogenic
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   SYQPLPNAGTKTVDFVLHIEPGRKIYVNEIHITGNNKTRDEVVRRELRQMESAPYDTSKL 382
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   258 LDFQQALEQNGHYSGASVQADFDRLQG -- DRVPVKVSVTEVKRHKLETGIRLDSEYGLGG 315
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          97 DNVKTMLRSKGYF----SSKVSLJEKDGAYTVHIT--PGPRTKIANVGVAILGDILSDG 149
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            : | : || DINEVPRAELEKLITMKPGKWYE------RQQMTAVLGEIQNRMGSAGYAYSEI- 322
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 ----RSTTQNLEKRAFSGG-----IWYVRDRAGIDA------RLGAEFLAE 402
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             223 EKVTDFYQNNGYFDFRILDTDIQTNEDKTRQTIKITVHEGGRFRWGKVSI-----EG 274
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          198 NTRAAVNPDTATVDLNVVVDSGRPIAFGDFEITGTQRYPEQIVSGLARFQPGTPYDLDLL 257
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     495 DPRKASTSVKQYKTTTAGGGVRMGIPVTEYDRVNFGLAAEHLTVNTYNKAPKRYADFIRK 554
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   150 NLAEYYRNALE-----GYPLAKLG 197
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Indels 149;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  8.1%; Score 256.5; DB 22; Length 792; 22.4%; Pred. No. 5.1e-12; ative 86; Mismatches 243; Indels 149;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          316 KIAYDYYNLFNKGYIGSVVWDMDKYETTLAAGISQPRNYRCNYWTS---NVSYN---
                                                                                      /note= "mature protein"
                                                 /note- "signal peptide"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Disclosure; Page 65-67; 83pp; English.
                 Location/Qualifiers
                                                                                                                                                                                                                                                                                                                                   Giuliani M;
                                                                                                                                                                                                   17-JAN-2001; 2001WO-IB00166
                                                                                                                                                                                                                                     17-JAN-2000; 2000GB-0001067
09-MAR-2000; 2000GB-0005699
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                                                                      22..792
                                                                                                                                                                                                                                                                                                                                 Rappuoli R,
                                                                                                                                                                                                                                                                                                                                                                 WPI; 2001-451895/48.
N-PSDB; AAH42129.
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                                                                                                                                                                                                                                                                                            (CHIR-) CHIRON SPA
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                                                                                                                          #0200152885-A1.
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The present invention describes an immunogenic composition (I) comprising a Neisseria antigen and an adjuvant composition comprising at least 1 CG motif. Also described is an adjuvant composition (II) comprising an oligonucleotide which comprises at least 1 CG motif and a complete Freund's adjuvant (GFA), where the oligonucleotide preferably comprises at least one phosphorothioate bond. AAA92335 to AAA92385 represent specifically claimed oligonucleotides of the present invention. (I) is useful for stimulating an immune response in a mammal, preferably a human, against Neisseria infection, preferably Neisseria meningitidis infection and in the mandacture of a medicament
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 for inducing a protective immune response in a mammal. The present sequence represents the claimed Neisseria gonorrheae amino acid sequence disclosed in GB-9928197.4, which is given in the present invention.
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           403 GRKIPGSDIDLGNSHATML---TASWKRQLLNNVLHPENGHYLDGKIGTTLGTFLSSTAL 459
                                                                                                                                                                                                                                                                                                                                                                                                    RGYELDSIGLAGPN----GSVLP----ERALLVGSLEYQLP---FTRTLSGAVFHDMGD 559
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        RGYE---SGTLGPKVYDEYGEKISYGGNKKANVSAELLFPMPGAKDARTVRLSLFADAGS 716
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            ----- AAANFKRM------KLKHGSGLGVRWFSPLAPFSFDIAY----G 593
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   CG motif; complete Freund's adjuvant; phosphorothioate; immunogenic; Neisseria antigen; Neisseria meningitidis; Neisseria gonorrhoeae; bactericidal; antibacterial; vaccine; immunostimulatory; infection;
                                                                                              555 YGKTDGAD----GSFKGLLYKGTVGWGRNKTDSASWPTRG-YLTG------VNAEI
                                                                                                                                                                                                                                                                      ALPGSKLQYYSATHNQTWFFPLSKTFTLMLGGEVGIAGGYGRTKEIPFFENFYGGGLGSV
                                                                                                                                                                                                  460 IRTSARAGYFFTPENK -----KLGTFIIRGQAGYTVARDNA-DVPSGLMFRSGGASSV
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Neisseria gonorrheae amino acid sequence.
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Wed Nov

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605 KLOYYSATHNOTWFFPLSKTFTLMLGGEVGIAGGYGRTKEIPFFENFYGGGLGSVRGYE- 663
            WO200138350-A2.
                                                                          29-NOV-1999;
                                31-MAY-2001
                                                                                                                                                                                                                                                                                                                                                                                                                                       Matches 135;
                                                                                                                                                                                                                                                                                                                                                                                               Sequence
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Best Local
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                                                                                                                                                                                                          383 QRSKERVELLGYFD--NYQFDAVPLAGTPDKVDLNMSLTERSTGSLDLSAGWVQDTGLVM 440
                                                                                                                                                                                                                                        366
                                                                                                                                                                                                                                                                                                                                                                                   559
                                                                                                                                                                                                                                                                                                                                                                                                                                                                      198 NTRAAVNPOTATVOLNVVVDSGRPIAFGDFEITGTQRYPEQIVSGLARFQPGTPYDLDLL 257
                                                                                                                                                                                             258 LDFQQALEQNGHYSGASVQADFDRLQG--DRVPVKVSVTEVKRHKLETGIRLDSEYGLGG 315
                                                                                                                                                                                                                                                             494
                                                                                                                                                                                                                                                                                 ----RSTTQNLEKRAFSGG-----IMYVRDRAGIDA------RLGAEFLAE 402
                                                                                                                                                                                                                                                                                                                             GRKIPGSDIDLGNSHATML---TASWKRQLLNNVLHPENGHYLDGKIGTTLGTFLSSTAL 459
                                                                                                                                                                                                                                                                                                                                                                                                                                    RGYE---SGTLGPKVYDEYGEKISYGGNKKANVSAELLFPMPGAKDARTVRLSLFADAGS 716
                                                                                                                                                                                                                                                                                                                                                                                                                                                          ------AAANFKRM-------KLKHGSGLGVRWFSPLAPFSFDIAY----G 593
                                                               DNVKTMLRSKGYF----SSKVSLTEKDGAYTVHIT--PGPRTKIANVGVAILGDILSDG 149
                                                                                   223 EKVTDFYQNNGYFDFRILDTDIQTNEDKTRQTIKITVHEGGRFRWGKVSI-----EG 274
                                                                                                          NLAEYYRNALE-----GYPLAKLG 197
                                                                                                                             DINEVPRAELEKLLIMKPGKWYE------ROOMTAVLGEIONRMGSAGYAYSEI- 322
                                                                                                                                                                                                                                                                                                     495 DPRKASTSVKQYKTTTAGGGVRMGIPVTEYDRVNFGLAAEHLTVNTYNKAPKRYADFIRK 554
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  "Mature N. meningitidis serogroup B antigen"
                                                                                                                                                               SOUPLPNAGTKTVDFVLHIEPGRKIYVNETHITGNNKTRDEVVRRELRQMESAPYDTSKL
                                                                                                                                                                                                                                                         441 SAGVSQDNLFGTG--KSAALRASRSKTTLNGSLS----FTDPYFTADGVSLGYDIYGKAF
                                                                                                                                                                                                                                                                                                                                                555 YGKTDGAD----GSFKGLLYKGTVGWGRNKTDSASWPTRG-YLTG-----VNAEI
                                                                                                                                                                                                                                                                                                                                                                                                                 RGYELDSIGLAGPN----GSVLP----ERALLVGSLEYQLP---FTRTLSGAVFHDMGD
                                                                                                                                                                                                                                       316 KIAYDYYNLFNKGYIGSVVWDMDKYETTLAAGISQPRNYRGNYWTS---NVSYN----
                                                                                                                                                                                                                                                                                                                                                                      460 IRTSARAGYFFTPENK-----KLGTFIIRGQAGYTVARDNA-DVPSGLMFRSGGASSV
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           715..722
/note= "ATP/GTP-binding site motif A (P-loop)"
                    Length 792;
                   Score 256.5; DB 22; Length Pred. No. 5.1e-12; Mismatches 243; Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Neisseria meningitidis serogroup B antigenic protein
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  B antigen; pharynx; meningitis infection; baculovirus; yeast.
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           8.1%; Scc.
22.4%; Pred
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777 PEDEIQRFQFQLGTTF 792
                                          Conservative
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/note= "!
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                               Similarity
792 AA;
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                                            138;
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bacterial
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 Sequence
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                     Query Match
                                 Local
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The sequence represents a Neisserla meningitidis serogroup B 85 kDa antigenic protein. Neisserla meningitidis colonises the pharynx, causing meningitis and, occasionally, septicaemia in the absence of meningitis. This antigenic protein is useful in the manufacture of a medicament for treating or preventing infection due to Neisserla bacteria, auch as meningitis and septicaemia. It is also useful as a diagnostic reagent for detecting the presence of Neisserla bacteria or antibodies raised against Neisserla, and as a reagent for raising the antibodies. The Neisserlal nucleotide sequences can be expressed in a variety of different expression systems, for example, mammallan cells, baculoviruses, plants,
                                                                                                                                                                                                                                                                                                                                                                                                                     Novel 85 kDa antigen from Neisserla meningitidis and Neisserla gonorrhoeae, useful in the manufacture of a medicament for treating and preventing Neisserlal bacterla infection -
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 DINEVPRABLEKLLIMKPGKMYE------RQOMTAVLGEIQNRMGSAGYAYSEI- 322
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   258 LDFQQALEQNGHYSGASVQADFDRLQG--DRVPVKVSVTEVKRHKLETGIRLDSEYGLGG 315
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        464
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         150 NLAEYYRNALE-----NWQQPVGSDFDQDSWENSKTSVLGAVTRK----GYPLAKLG 197
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Pred, No. 1e-11;
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21.9%; Pred
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                                                                                                                                                           (CHIR-) CHIRON SPA.
(STAT-) STATENS INST FOLKEHELSE.
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28-NOV-2000; 2000WO-IB01851
                                                                99GB-0028197
                                                                                           09-MAR-2000; 2000GB-0005698
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N-PSDB; AAS07277.
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Best Local Similarity
Matches 135; Conserv
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Peptide
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                                                         593
                                                                        722 TYDDNSSSATGGRVQNIYGAGNTHKSTFTNELRYSAGGAVTWLSPLGPMKFSYAYPLKKK 781
                                                                                                                                                                                                                                                                                   protein; pharynx; meningitis; septicaemia; mammalian cell;
infection; baculovirus; yeast; Neisseria meningitidis.
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                         --SGTLGPKVYDEYGEKISYGGNKKANVSAELLFPMPGAKDARTVRLSLFADAGSVWDGK
                                                         DSIGLAGPN----GSVLP----ERALLVGSLEYQLP---FTRTLSGAVFHDMGD-
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/note= "Signal peptide"
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(STAT-) STATENS INST FOLKEHELSE
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                                                                                                                    22..797
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Giuliani MM, Pizza M,
                                                                                                      594 HSDKKIRWHISLGTRF
                                                                                                                                                                                                                                                                                                                       Neisseria gonorrhoeae.
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Length 797;

8.0%; Score 253; DB 22;

Query Match

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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  -TSNVSYNRSTTQNLEKRAFSGGIWYVRDRAGIDA------RLGAEFLAEGRKI 406
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                                                                                                                                                 150 NLAEYYRNALE-----GYPLAKLG 197
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              559 DGTD---GSFKGWLYKGTVGWGRNKTDSALWPTRG-YLTG------VNAEIALPGS 604
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    --SCTLGPKVYDEYGEKISYGGNKKANVSAELLFPMPGAKDARIVRLSLFADAGSVWDGK 721
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                    Gaps
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/note= "Signal peptide"
22..797
/note= "Mature N. meningitidis serogroup A antigen"
                                                                                                                                                                                            DINEVPKAELEKLLIMKPGKWYE------ROOMTAVLGEIONRMGSAGYAYSEI-
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                                                                                                  223 EKVTDFYONNGYFDFRILDTDIOTNEDKTKOTIKITVHEGGRFRWGKVSI-----EG
                      144;
; Pred. No. 1e-11;
89; Mismatches 248; Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Neisseria meningitidis serogroup A antigenic protein #2
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Location/Qualifiers
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        AAU04451 standard; Protein; 797 AA
21.9%;
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |: |: |II |
PEDEIQRFQFQLGTTF 797
                    Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                meningitidis.
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Conservative
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Matches 135; Conserv
                                                                                                                                                                                                                                                                                              17-SEP-2001
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           component
                                                                                                                                                                                                                                                            AAB84744;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Sequence
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Protein
                                                                                                                                                                                                                                                                                                                                                                                         vaccine
                    260
                                                                                                                                                                                    RESULT 16
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 26;
                                                                                                                                                                                                                                                                                                                                             antigenic protein. Neisseria meningitidis colonises the pharynx, causing meningitis and, occasionally, septicaemia in the absence of meningitis. This antigenic protein is useful in the manufacture of a medicament for treating or preventing infection due to Neisseria bacteria, such as meningitis and septicaemia. It is also useful as a diagnostic reagent for detecting the presence of Neisseria bacteria or antibodies raised against Neisseria, and as a reagent for relating the antibodies. The Neisserial nucleotide sequences can be expressed in a variety of different expression systems, for example, mammalian cells, baculoviruses, plants,
                                                                                                                                                                                                                  Novel 85 kDa antigen from Neisseria meningitidis and Neisseria gonorrhoeae, useful in the manufacture of a medicament for treating and preventing Neisserial bacteria infection -
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    333 SVQPLPNAETKTVDFVLHIEPGRKIYVNEIHITGNNKTRDEVVRRELRQMESAPYDTSKL 382
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         383 QRSKERVELLGYFD--NVQFDAVPLAGTPDKVDLNMSLTERSTGSLDLSAGWVQDTGLVM 440
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          559
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               --SGTLGPKVYDEYGEKISYGGNKKANVSAELLFPMPGAKDARTVRLSLFADAGSVWDGK 721
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   DNVKTMLRSKGYF----SSKVSLTEKDGAYTVHIT--PGPRTKIANVGVAILGDILSDG 149
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             198 NTRAAVNPDTATVDLNVVVDSGRPIAFGDFEITGTQRYPEQIVSGLARFQPGTPYDLDLL 257
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     258 LDFQQALEQNGHYSGASVQADFDRLQG--DRVPVKVSVTEVKRHKLETGIRLDSEYGLGG 315
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             316 KIAYDYYNLFNKGYIGSVVWDMDKYETTL....-AAGISQPRNYRGNYW---- 359
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               SAGVSQDNLFGTG--KSAALRASRSKTTLNGSLSFTDPYFTADGVSLGYDVYGKAFDPRK 498
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    -TSNVSYNRSTTQNLEKRAFSGGIWYVRDRAGIDA------RLGAEFLAEGRKI 406
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            464
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   EKVIDFYQNNGYFDFRILDTDIQTNEDKTKQTIKITVHEGGRFRWGKVSI-----EG 274
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       150 NLAEYYRNALE------NWQQPVGSDFDQDSWENSKTSVLGAVTRK----GYPLAKLG 197
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                ----VNAEIALPGS 604
                                                                                                                                                                                                                                                                                                                                sequence represents a Neisseria meningitidis serogroup A 85 kDa
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  RAGYFFTPENK-----KLGTFIIRGQAGYTVARDNA-DVPSGLMFRSGGASSVRGYEL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         DINEVPRAELEKLLIMKPGKWYE------RQQMTAVLGEIQNRMGSAGYAYSEI-
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          407 PGSDIDLGNSHATML--TASWKRQLLNNVLHPENGHYLDGKIGTTLGTFLSSTALIRTSA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        DSIGLAGPN----GSVLP----ERALLVGSLEYQLP----FTRTLSGAVFHDMGD----
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Note: There are two versions of this sequence displayed in the specification (see AAU03958).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           8.0%; Score 253; DB 22; Length 797;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          21.9%; Pred. No. 1e-11,
Live 89; Mismatches 248; Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            559 DGTD---GSFKGWLYKGTVGWGRNKTDSALWPTRG-YLTG---
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                                                                                                                                                                                                                                                                                        Claim 1; Page 39-40; 92pp; English.
                                                                                                                                                Rappuoli
                                                                                       CHIRON SPA.
STATENS INST FOLKEHELSE.
28-NOV-2000; 2000WO-IB01851.
                                    29-NOV-1999; 99GB-0028197.
09-MAR-2000; 2000GB-0005698.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Matches 135; Conservative
                                                                                                                                              Pizza M,
                                                                                                                                                                                  WPI; 2001-381289/40
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  bacterla and yeast,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Similarity
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       797 AA;
                                                                                                                                                Giuliani MM,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Sequence
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                                                                                                            (STAT-)
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The present sequence represents a Neisseria serogroup B protein. The protein is used to produce the compositions of the invention. The specification describes a composition, comprising a Neisseria meningitidis serogroup B outer membrane preparation and an immunogenic component. The immunogenic component is protein disclosed in WO99/57280, WO99/5864, WO99/54679, WO99/58731, WO99/58673, WO
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Composition for treating or preventing infection to, detecting, or for raising antibodies against Neisserial bacteria, comprises an N. meningitidis serogroup B outer membrane preparation and an immunogenic
---AAANFKRM----KLKHGSGLGVRWFSPLAPFSFDIAY----G 593
                                                                          722 TYDDNSSSATGGRVQNIYGAGNTHKSTFTNELRYSAGGAVTWLSPLGPMKFSYAYPLKKK 781
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Serogroup B protein; outer membrane protein; Neisserial Infection;
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21.9%; Pred. No. 1e-11;
ive 89; Mismatches 248; Indels 140
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Amino acid sequence of a Neisseria serogroup B protein.
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22..797
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         17-JAN-2001; 2001WO-IB00166
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                                                                                                                                                                                                                                                                                                                                                                            782 PEDEIORFOFOLGTTF 797
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         2001-451895/48.
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Gaps

Indels 144;

us-09-857-669-2.rag

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SVQPLPNAETKTVDFVLHIEPGRKIYVNEIHITGNNKTRDEVVRRELRQMESAPYDTSKL 382
                                                                                                                                                                                                                                                                                                                              RAGYFFTPENK -----KLGTFIIRGOAGYTVARDNA-DVPSGLMFRSGGASSVRGYEL 516
----SSKVSLTEKDGAYTVHIT -- PGPRTKIANVGVAILGDILSDG 149
                                                                                                                                      LDFQQALEQNGHYSGASVQADFDRLQG - DRVPVKVSVTEVKRHKLETGIRLDSEYGLGG 315
                                                                                                                                                                                                           SAGVSQDNLFGTG--KSAALRASRSKTTLNGSLSFTDPYFTADGVSLGYDVYGKAFDPRK 498
                                                                                                                                                                                                                                  -TSNVSYNRSTTQNLEKRAFSGGIWYVRDRAGIDA------RLGAEFLAEGRKI 406
                                                                                                                                                                                                                                                                                PGSDIDLGNSHATML---TASWKRQLLNNVLHPENGHYLDGKIGTTLGTFLSSTALIRTSA 464
                                                                                                                                                                                                                                                                                              ---SGTLGPKVYDEYGEKISYGGNKKANVSAELLFPMPGAKDARTVRLSLFADAGSVWDGK 721
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                                                                  ---ROOMTAVLGEIONRMGSAGYAYSEI- 322
                                                                                                                                                                                                                                                STSIKQYKTTTAGAGIRMSVPVTEYDRVNFGLVAEHLJVNTYNKAPKHYADFIKKYGKT
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                                                                                         NTRAAVNPDTATVDLNVVVDSGRPIAFGDFEITGTQRYPEQIVSGLARFQPGTPYDLDLL
                                                                                                                                                                                      ----AAGISQPRNYRGNYW----
                                                                                                                                                                                                                                                                                                                                                                           DSIGLAGPN----GSVLP----ERALLVGSLEYQLP---FTRTLSGAVFHDMGD----
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Amino acid sequence of a Neisseria serogroup A protein
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/note= "signal peptide"
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                                                           : | : | DINEVPKAELEKLLTMKPGKWYE----
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DNVKTMLRSKGYF
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              The present sequence represents a Neisseria serogroup A protein. The protein is used to produce the compositions of the invention. The specification describes a composition, comprising a Neisseria meningitidis serogroup B outer membrane preparation and an immunogenic component. The immunogenic component is protein disclosed in WO99/57280, WO99/361132, WO99/58613, 
                                                                                                                                                                                                                                                                                           Composition for treating or preventing infection to, detecting, or for raising antibodies against Neisserial bacteria, comprises an N. meningitidis serogroup B outer membrane preparation and an immunogenic
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         SAGVSQDNLFGTG - - KSAALRASRSKTTLNGSLSFTDPYFTADGVSLGYDVYGKAFDPRK 498
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         -TSNVSYNRSTTQNLEKRAFSGGIWYVRDRAGIDA------RLGAEFLAEGRKI 406
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                                                                                                                                                                                                                                                                                                                                                                                                                                           Disclosure; Page 71-74; 83pp; English.
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17-JAN-2000; 2000GB-0001067
09-MAR-2000; 2000GB-0005699
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                                                                                                                                                  Pizza M, Rappuoli R,
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275 DINEVPKAELEKLLTMKPGKWYE------RQOMTAVLGEIQNRMGSAGYAYSEI- 322
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   comprising a Meisseria antigen and an adjuvant composition comprising an oligonuclectide comprising at least 1 CG motif. Also described is an adjuvant composition (II) comprising an oligonuclectide which comprises at least 1 CG motif and a complete Freund's adjuvant (CFA), where the oligonuclectide preferably comprises at least one phosphorothioate bond. AAA92359 to AAA92385 represent specifically claimed oligonuclectides of the present invention. (I) is useful for stimulating an immune response in a mammal. preferably a human, against Neisseria infection, preferably for inductions a protective immune response in a mammal. The present sequence represents the claimed Neisseria meningitidis serogroup B amino acid sequence disclosed in GB-9928197.4, which is given in the present
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Immunogenic composition useful for stimulating an immune response in a mammal against Neisseria infection, comprises Neisseria antigen and an adjuvant composition comprising an oligonucleotide with a CG motif -
  -----AAANFKRM----KLKHGSGLGVRWFSPLAPFSFDIAY----G 593
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                                            781
                                                                                                                                                                                                                                                                                                                                                                                                                          CG motif; complete Freund's adjuvant; phosphorothioate; immunogenic
Neisseria antigen; Neisseria meningitidis; Neisseria gonorrhoeae;
bactericidal; antibacterial; vaccine; immunostimulatory; infection;
                         The present invention describes an immunogenic composition (I)
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21.9%; Pred. No. 1e-11;
ive 89; Mismatches 248;
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Immunogenic composition useful for stimulating an immune response in a mammal against Neisseria infection, comprises Neisseria antigen and an adjuvant composition comprising an oligonucleotide with a CG motif -
                                                                                                                                                                                     -TSNVSYNRSTTQNLEKRAFSGGIWYVRDRAGIDA------RLGAEFLAEGRKI 406
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              499 ASTSIKQYKTTTAGAGIRMSVPVTEYDRVNFGLVAEHLTVNTYNKAPKHYADFIKKYGKT 558
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                465 RAGYFFTPENK-----KLGTFIIRGQAGYTVARDNA-DVPSGLMFRSGGASSVRGYEL 516
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  559
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               --SGTLGPKVYDEYGEKISYGGNKKANVSAELLFPMPGAKDARTVRLSLFADAGSVWDGK 721
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      PGSDIDLGNSHATML--TASWKRQLLNNVLHPENGHYLDGKIGTTLGTFLSSTALIRTSA 464
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             ---AAANFKRM----KLKHGSGLGVRWFSPLAPFSFDIAY----G 593
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       CG motif; complete Freund's adjuvant; phosphorothioate; lmmunogen1c;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Neisseria antigen; Neisseria meningitidis; Neisseria gonorrhoeae;
bactericidal; antibacterial; vaccine; immunostimulatory; infection;
NTRAAVNPDTATVDLNVVVDSGRPIAFGDFEITGTQRYPEQIVSGLARFQPGTPYDLDLL
                                     SVQPLPNAETKTVDEVLHIEPGRKIYVNEIHITGNNKTRDEVVRRELRQMESAPYDTSKL
                                                                                                                                               LDFQQALEQNGHYSGASVQADFDRLQG - - DRVPVKVSVTEVRRHKLETGIRLDSEYGLGG
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                                                                                                                                                                                                                                                                                           316 KIAYDYYNLFNKGYIGSVVWDMDKYETTL------AAGISQPRNYRGNYW----
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Sequence
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                        The present invention describes an immunogenic composition (I)

Comprising a Neisseria antigen and an adjuvant composition comprising an

Comprising a Neisseria antigen and an adjuvant composition comprising an

Coligonucleotide comprising at least 1 CG motif. Also described is an

Coligonucleotide which comprises

CC at least 1 CG motif and a complete Freund's adjuvant (CFA), where the

CL AA92359 to AA92385 represent specifically claimed oligonucleotides of

the present invention. (I) is useful for stimulating an immune response

In a mammal, preferably a human, against Neisseria infection, preferably

Neisseria meningitidis infection and in the manufacture of a medicament

for inducing a protective immune response in a mammal. The present

S sequence represents the claimed Neisseria meningitidis serogroup A amino

acid sequence disclosed in GB-9928197.4, which is given in the present
                                                                                                                                                                                                                                                                              26;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                      258 LDFQQALEQNGHYSGASVQADFDRLQG--DRVPVKVSVTEVKRHKLETGIRLDSEYGLGG 315
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         316 KIAYDYYNLFNKGYIGSVVWDMDKYETTL------AAGISQPRNYRGNYW---- 359
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         -TSNVSYNRSTTQNLEKRAFSGGIWYVRDRAGIDA------RLGAEFLAEGRKI 406
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            RAGYFFTPENK-----KLGTFIIRGQAGYTVARDNA-DVPSGLMFRSGGASSVRGYEL 516
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   605 KLQYYSATHNOTWFFPLSKTFTLMLGGEVGIAGGYGRTKEIPFFENFYGGGLGSVRGYE- 663
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             DSIGLAGPN-----GSVLP----ERALLVGSLEYQLP---FTRTLSGAVFHDMGD---- 559
                                                                                                                                                                                                                                                                             Gaps
                                                                                                                                                                                                                                                                                                     DNVKTMLRSKGYF----SSKVSLTEKDGAYTVHIT--PGPRTKIANVGVAILGDILSDG 149
                                                                                                                                                                                                                                                                                                                              223 EKVTDFYQNNGYFDFRILDTDIQTNEDKTKQTIKITVHEGGRFRWGKVSI-----EG 274
                                                                                                                                                                                                                                                                                                                                                      150 NLAEYYRNALE-----GYPLAKIG 197
                                                                                                                                                                                                                                                                                                                                                                                                       198 NTRAAVNPDTATVDLNVVVDSGRPIAFGDFEITGTQRYPEQIVSGLARFQPGTPYDLDLL 257
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 441 SAGVSQDNLFGTG--KSAALRASRSKTTLNGSLSFTDPYFTADGVSLGYDVYGKAFDPRK 498
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                499 ASTSIKOYKTTTAGAGIRMSVPVTEYDRVNFGLVAEHLTVNTYNKAPKHYADFIKKYGKT 558
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          PGSDIDLGNSHATML - - TASWKRQLLNNVLHPENGHYLDGKIGTTLGTFLSSTALIRTSA 464
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 559 DGTD---GSFKGWLYKGTVGWGRNKTDSALWPTRG-YLTG------VNAEIALPGS 604
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     --SGTLGPKVYDEYGEKISYGGNKKANVSAELLFPMPGAKDARTVRLSLFADAGSVWDGK 721
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Length 797;
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                                                                                                                                                                                                                                                                ; Pred. No. 1e-11;
89; Mismatches 248;
                                                                                                                                                                                                                                                   8.0%; Score 253; DB 22;
21.9%; Pred. No. 1e-11;
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             22; Page 33; 39pp; English.
                                                                                                                                                                                                                                                                            Matches 135; Conservative
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                                                                                                                                                                                                                                                                Similarity
                                                                                                                                                                                                                          797 AA;
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             Claim
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The present sequence represents an outer membrane protein (omp) 85 of Neisseria meningitidis. The omp polypeptides and polynucleotides are useful in compositions for use in the prevention, treatment and diagnosis of non-symptomatic genococcal infection or meningococcal infection and symptomatic disease. They are also useful for the detection of hybridisation complexes. Antigens and antibodies specific omp proteins also provide diagnostic, therapeutic and prophylactic compositions for the treatment or prevention of the infections described above. The antibodies are useful for inducing a protective immune response in humans or animals with N. gonorrhoeae, N. meningitidis, or other Neisseria species. The proteins, antibodies and polynucleotide sequences of the present invention may also be used in the screening and development of chemical compounds such as drugs or vaccines.
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                                                                                                                                                 Outer membrane protein; omp85; gonococcal infection; symptomatic disease; meningococcal infection; protective immune response; vaccine.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            New isolated outer membrane protein 85 of Neisseria gonorrhoeae and N. meningitidis useful for vaccine, therapeutic and diagnostic compositions for gonococcal or meningococcal infections
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     LDFQQALEQNGHYSGASVQADFDRLQG--DRVPVKVSVTEVKRHKLETGIRLDSEYGLGG 315
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         275 DTNEVPKAELEKLLTMKPGKWYE------ROOMTAVLGEIONRMGSAGYAYSEI- 322
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21.9%; Pred. No. 1.5e-11;
ive 89; Mismatches 248; Indels 144;
                                                                          Amino acid sequence of outer membrane protein (omp) 85.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Claim 41; Page 89-92; 98pp; English.
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    (first entry)
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                                                                                                                                                                                                                                                                                 Neisseria meningitidis.
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N-PSDB; AAA15156.
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21-AUG-2000
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651 LFHPIGEYSSIFVGYRIDQYRLYDIPSTAPRSYLDYQGKNISSVVSGGFTFDSTDSRBRP 710
                                                                                                  DDHKNYEQYFSLSVMQDDVK----ALTDFYSDYGYAFAEV-DLETTKNEEDATIDVTFL1 483
                                                                                                                                                                  DSGRPIAFGDFEITGTQRYPEQIVSGLARFQPGTPYDLDLLLDFQQALEQNGHYSGASVO 276
                                                                                                                                                                                                                 DKKQKVFLRRIIVEGNTRTRDNVILRELRLADGDLFNGQHLRRSNECLNRLGYFN----Q 539
                                                                                                                                                                                                                                                                277 ADFDRL---QGDRVPVKVSVTEVKRHKLETG1--RLDSEYGLGGKIAYDYYNLFNKGYIG 331
                                                                                                                                                                                                                                                                                           SVVWDMDKYETTLAAGISQPRNYRGNYWTSNVSYN-RSTTQNLEKRAFSGGIWYVRDRAG 390
                                                                                                                                                                                                                                                                                                                                                                                                                                                      391 IDARLGA-EFLAEGRKI-----PGSDIDL-GNSHATMLTASWKRQLLNNVLHP 436
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 437 ENGH-----YLDGKIGTTLGTFLSSTALIRTSARAGYFFTPENKKLGTFIIRGQAGYT 489
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                711 SKGHIAKLIVEYGGGGLG-----GNDNFFKPIAELQGFYSISRSKNHIIHWRTRAGAA 763
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               490 VARDNADVPSGLMFRSGGASSVRGYELDSIGLAGPN-GSVLPERALLVGSLEYQLPFTRT 548
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     ---ENWQQPVGSDFDQDSWENSKTSVLGAVTRKGYPLAKLGNTRAAVNPDTATVDLNVVV
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SIEGFISSKSSSLDLSFTNPRVYDTDFGFSNNIYTLRDEWDDFRKKTYG------DTIR
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            LSGAV - · FHDMGDAAANFKR - · · · · MKLKHGSGLGVRWFSPLAPFSFDIAYG - · · · · · HSD
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Human; chromosome mapping; gene mapping; gene therapy; forensic; food supplement; medical imaging; diagnostic; genetic disorder.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Novel human diagnostic protein #17701.
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         2000US-0540217.
2000US-0649167.
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882 KKTRGRFEFSMGQFF
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N-PSDB; AAS81897.
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              (HYSE-) HYSEQ INC
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23-AUG-2000;
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                The present invention provides isolated polynucleotides encoding Hira, pond, HPC, Lyss, vefw, ABC1 or Ompilo protein of Lawsonia Intracellularis. The sequences can be used in vaccines for the prevention of Lawsonia intracellularis infection. The present sequence is a protein
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Htra: Pona; Hypc; Yefw; ABC1; Ompl00; Lawsonia intracellularis infection;
STSIKQYKTTTAGAGIRMSVPVTEYDRVNFGLVAEHLTVNTYNKAPKHYADFIKKYGKT 558
                                                                                                                                                             RAGYFFTPENK-----KLGTFIIRGQAGYTVARDNA-DVPSGLMFRSGGASSVRGYEL 516
                                                                                                                                                                                           464
                                                                                                                                                                                                                                                                                        --SGTLGPKVYDEYGEKISYGGNKKANVSAELLFPMPGAKDARTVRLSLFADAGSVWDGK 721
                                                                                                                                                                                                                                                                                                                                                                                      722 TYDDNSSSATGGRVQNIYGAGNTHKSTFTNELRYSAGGAVTWLSPLGPMKFRYAYPLKKK 781
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                317 IKDVRIEGLETIKAKTLKKELALTERNFLSWFTGTGVLREEYLERDSIAISAYAMNHGYV 376
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  ----SSKVSLTEKDGAYTVHITPGPRTKIANVGVAILGDILSDGNLAEYYRNAL---- 159
                                                                                                              DGTD---GSFKGWLYKGTVGWGRNKTDSALWPTRG-YLTG------VNAEIALPGS 604
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    IKDMVEEHLPLI----TQQQEEVLDKEQ-----TGFLAEEAPDN----VKTMLRSKGYF 109
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                                                                                                                                                                                                                                                                                                                                                        ---AAANFKRM----KLKHGSGLGVRWFSPLAPFSFDIAY----G
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Lawsonia intracellularis polynucleotide and encoded protein, used prevent Lawsonia intracellularis infection -
                                                                PGSDIDLGNSHATML--TASWKRQLLNNVLHPENGHYLDGKIGTTLGTFLSSTALIRTSA
                                                                                                                                                                                                                                                           517 DSIGLAGPN----GSVLP----ERALLVGSLEYQLP---FTRTLSGAVFHDMGD----
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Pred. No. 3.7e-11;
5; Mismatches 276; Indels 104;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Lawsonia intracellularis protein SEQ ID NO: 5.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Claim 12; Page 43-45; 67pp; Japanese.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 AAG78603 standard; Protein; 896 AA.
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22.8%; Pred
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Lawsonia intracellularis.
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The invention relates to isolated polynucleotide (I) and polypeptide (II) sequences. (I) is useful as hybridisation probes, polypeptide (II) sequences. (I) is useful as hybridisation probes, and for chromosome and gene mapping, and in recombinant production of (II). The polynucleotides are also used in diagnostics as expressed sequence tags for identifying expressed genes. (I) is useful in gene therapy techniques to restore normal activity of (II) or treat disease states involving (II). (II) is useful for generating antibodies against it, detecting or quantitating a polypeptide in tissue, as molecular weight markers and as (II). (II) and its binding partners are useful in medical imaging of stees expressing (II). (I) and its binding partners are useful in medical disorders involving aberrant protein expression or biological activity. The propertide and polynucleotide sequences have applications in classonshible for genetic disorders or other traits to assess biodiversity and to produce other types of data and products dependent on DNA and amino acid sequences of the invention.

Conditional maino acid sequences of the invention.

Considering the prince of the printed of sequences of the invention.

Considering the printed of the printed of sequences of the invention.
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   480 FIIRGQAGYTVARDNADVPSGLMFRSGGASSVRGYELDSIGLAGPNGSVLPERALLVGSL 539
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     EYQLPFTRTLSGAVFHDMGDAAANFKRMKLKHGSGLGVRWFSPLAPFSFDLAYGHSDKK- 598
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           BASB081; infection; otitis media; pneumonia; sinusitis; inflammation; therapy; antibacterial; antiinflammatory; vaccine;
responsible for genetic disorders or other traits and to assess
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  DB 22; Length 474;
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              7.0%; Score 222.5; DB 2
39.5%; Pred. No. 1.5e-09;
ilve 19; Mismatches 56
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Moraxella catarrhalis BASB081 mature protein.
                                                                                                                                                                                                                                                                                                                                                                                                                                            at ftp.wipo.int/pub/published_pct_sequences
                                                 Claim 20; SEQ ID No 48069; 103pp; English.
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335
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tes 51; Conserv
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                biodiversity
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Wc2391 (ATCC 43617) BASB081 mature protein. BASB081 is related by maino acid sequence homology to Neisseria meningitidis omp85 outer membrane protein. The sequence was deduced from PCR-amplified DNA case AAA50537), and shows 99.9% homology to the mature region of a BASB081 gene translation product (see AAA95987). The invention provides BASB081 polypetides, polynuclectides, expression vectors, provides BASB081 polypetides, polynuclectides, expression vectors, chost cells, and a process for producing a BASB081 polypeptide. Also provided are vaccine compositions comprising a BASB081 polypeptide. Or polynuclectide, and optionally at least 1 other M. catarrhalis antigen. A method for diagnosing a M. catarrhalis infection antibody that is immunospecific for it, in a sample. A therapeutic composition useful in treating M. catarrhalis diseases in humans comprises an immunospecific for it, in a sample. A therapeutic composition be a bacterial infection, e.g. otitis media in infants and children, pneumonia in elderlies, sinusitis, nosocomial infections and children, pneumonial in elderlies, sinusitis, nosocomial infections and accumulation in the middle ear, auditive nerve damage, delapmation compensation and inflammation content of the catarrhalis and inflammation and inflammation and inflammation.
                                                                                                                                                                              New BASB081 polypeptides from Moraxella catarrhalis and polynucleotides encoding the polypeptides used for treating infections, or as a vaccine for preventing infections, especially those caused by M. catarrhalis
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          337 MDKYETTLAAGISQPRNYRGNYWTSNVSYNRSTTQNLEKRAFSGGIWYVRDRAGIDARLG 396
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      632 FDLSTRTLEHEISRSIIQNGGW---NRTYSLRYRLDKLKTQAPPETWQDLPVDFVNGKPS 688
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   501
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    PDTESVKLKPKFPVRIDTQDSEIKDMVEEHLPLITQQQEEVLDKEQTGFLAEEAPDNVKT 101
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              102 MLRSKGYFSSKVSLTEKDGAYTVHITPGPRTKIANVGVAILGDILSDGNLAEYYRNALEN 161
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            ----RLSEDKKGVKLYATKPLSHPLNDQLRAT----LG------YQQEVFGHSTNG 631
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                432 PVIETVELTDGILMDISPIEFSASNLIQDKLNLVAAKARHLYDMPDDRVLAINHDDGVNR 491
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          492 SI--LGRISDAVSA-------VARAILPDESENEVIDLPERTALAN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           162 WQQPVGSDFDQDSWENSKTSVLGAVTRKGYPLAKLGNTRAAVNPDTATVDLNVVVDSGRP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    ----IAFGDFEITGTQRYPEQIVSGLARFQPGTPYDLDLLLDFQQAL-EQNGHYSGASVQ
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      529 RKTPA----- DVYQSKK------VPLYVFVASDKP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    397 AEFLAEGRKIPGSDIDLGNSHATMLTASWKRQLLNNVLHPENGHYLDGKIGTTLGTFLSS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   TALIRTS----ARAG-----YFFTPENKKLGTFIIRGQAGYTVARDNADVPSGL
                                                                                                                                                                                                                                                                                                                         present sequence is that of the Moraxella catarrhalis strain
                   (SMIK ) SMITHKLINE BEECHAM BIOLOGICALS.
                                                                                                                                                                                                                                                                          Claim 1; Page 61; 97pp; English.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Matches 130; Conservative
                                                                                                             WPI; 2000-587296/55.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Local Similarity
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   of the middle ear.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             889 AA;
                                                                                                                                     N-PSDB; AAA50537
                                                                 Ruelle J;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Sequence
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Query Match
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     The present sequence is that of the Moraxella catarrhalis strain Mc2391 (ATCC 43617) BASB081 protein, which is related by amino acid sequence homology to Neisserla meningitidis omp85 outer membrane protein. It shows 99.9% homology in the mature region to sequence (see AAY95988) deduced from a PCR product. The invention sequence (see AAY95988) deduced from a PCR product. The invention provided are vaccine compositions comprising a BASB081 polypeptide. Onlypeptide or producing a BASB081 polypeptide. Also provided are vaccine compositions comprising a M. catarrhalis infection involves identifying a BASB081 polypeptide, or an antibody in treating M. catarrhalis diseases in humans composition useful in treating M. catarrhalis diseases in humans composition useful in treating M. catarrhalis diseases in humans composition as bacterial infection, e.g. outitis media in infants and children, pneumonia in elderlies, sinusitis, nosocomial infections and invasive diseases, chronic otitis media with hearing loss, fluid accumulation in the middle ear, auditive nerve damage,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               New BASBO81 polypeptides from Moraxella catarrhalis and polynucleotides encoding the polypeptides used for treating infections, or as a vaccine for preventing infections, especially those caused by M. catarrhalis -
                          502 MFRSGGASSVRGYELDSIGLAGPNGSVLPERALLVGSLEYQLPFTRTLSGAVFHDMGDAA 561
                                                                                                                                                                                                                                                       BASB081; infection; otitis media; pneumonia; sinusitis; inflammation; therapy; antibacterial; antiinflammatory; vaccine;
                                                                              DKGFTNDTKIGAGVGVRWASPVGQVRVDVATGVKEEGNPIKLHFFIGTPF 889
                                                            562 ANFKRMKLKHGSGLGVRWFSPLAPFSFDIAYGHSDK -- KIRWHISLGTRF
                                                                                                                                                                                                                                                                                                                                                                                                             /note= "Ile in sequence of AAY95988"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         (SMIK ) SMITHKLINE BEECHAM BIOLOGICALS.
                                                                                                                                                                                                                                                                                                                                                           label Signal_peptide
                                                                                                                                                                                                                                                                                                                                                                                     label- Mature_protein
                                                                                                                                                                                                                               Moraxella catarrhalis BASB081 protein.
                                                                                                                                                                                                                                                                                                                                   Location/Qualifiers
                                                                                                                                                    AAY95987 standard; Protein; 919 AA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Claim 1; Page 60; 97pp; English.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        23-FEB-2000; 2000WO-EP01468
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 99GB-0004559
                                                                                                                                                                                                       (first entry)
                                                                                                                                                                                                                                                                                                          Moraxella catarrhalis.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           WPI; 2000-587296/55.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        N-PSDB; AAA50536.
                                                                                                                                                                                                                                                                                                                                                                                                 Misc-difference
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                                                                                                                                                                                                                                                                                   dlagnosis
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Ruelle J;
                                                                                                                                                                             AAY95987;
                                                                                                                                                                                                                                                                                                                                              Peptide
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----IAFGDFEITGTQRYPEQIVSGLARFQPGTPYDLDLLLDFQQAL-EQNGHYSGASVQ 276
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     277 ADFDRLQGDRVPVKVSVTEVKRHKLETGIRLDSEYGLGGKIAYDYYNLFNKGYIGSVVWD 336
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              337 MDKYETTLAAGISQPRNYRGNYWTSNVSYNRSTTONLEKRAFSGGIWYVRDRAGIDARLG 396
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      662 FDLSTRTLEHEISRSIIQNGGW---NRTYSLRYRLDKLKTQAPPETWQDLPVDEVNGKPS 718
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       397 AEFLAEGRKIPGSDIDLGNSHATMLTASWKROLLNNVLHPENGHYLDGKJGTTLGTFLSS 456
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Gaps
                                                                                                                                                                                                                                                42 PDTESVKLKPKFPVRIDTQDSEIKDMVEEHLPLITQQQEEVLDKEQTGFLAEEAPDNVKT 101
                                                                                                                                                                                                                                                                                                                                                           102 MLRSKGYFSSKVSLTEKDGAYTVHITPGPRTKIANVGVAILGDILSDGNLAEYYRNALEN 161
                                                                                                                                                                                                                                                                                                                                                                                                           -----VARAILPDESENEVIDLPERTALAN 558
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           661
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     SGLVSDANMAIARAGISGVYSFGDNAYGSNRAHQMTGGI----QAGYIWSDNFNHVPYRL 809
                                                                                                                                                                                                                                                                                                   462 PVIETVELTDGILMDISPIEFSASNLIQDKLNLVAAKARHLYDMPDDRVLAINHDDGVNR 521
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                ----RLSEDKKGVKLYATKPLSHPLNDQLRAT----LG-----YQQEVFGHSTNG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  TALIRTS----ARAG-----YFFTPENKKLGTFIIRGOAGYTVARDNADVPSGL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           502 MFRSGGASSVRGYELDSIGLAGPNGSVLPERALLVGSLEYOLPFTRTLSGAVFHDMGDAA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                    162 WQQPVGSDFDQDSWENSKTSVLGAVTRKGYPLAKLGNTRAAVNPDTATVDLNVVVDSGRP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Vaccine; passive immunization; vector; antiserum; diagnosis; D15;
delayed speech learning, upper respiratory tract infection, and inflammation of the middle ear.
                                                                                                                                                                                             Indels 154;
                                                                                                                                       Length 919;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   870 DKGFTNDTKIGAGVGVRWASPVGQVRVDVATGVKEEGNPIKLHFFIGTPF 919
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   562 ANFKRMKLKHGSGLGVRWFSPLAPFSFDIAYGHSDK--KIRWHISLGTRF 609
                                                                                                                                    6.9%; Score 219; DB 21;
22.0%; Pred. No. 7.7e-09;
ive 74; Mismatches 232;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          H. influenzae PAK 12085 D15 sequence.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           AAR53758 standard; Protein; 793 AA.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      OMP; outer membrane protein; NTHI.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Haemophilus influenzae PAK 12085.
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                                                                                                                                                                 Best Local Similarity 22.09
Matches 130; Conservative
                                                                                                                                                                                                                                                                                                                                                                                                              522 SI--LGRISDAVSA----
                                                                               919 AA;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       08-DEC-1994
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    WO9412641-A
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                                                                                  Sequence
                                                                                                                                          Query Match
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23-NOV-1993;
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                                                                                          08-DEC-1994
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Sednence
                                                                   AAR53757;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Query Match
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                                                                                                                                                                                                                                                                                                                         fang Y;
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Matches
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                       26
                                   AAR53757
                      RESULT
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                                                                                                                                                                                                                                                                                                                       24;
                                                                                                                                                             chromosomal libraries of H. influenzae type b (Hib) strains Ca, Eagan and Minn A, and the non-typeable (NTH1) strains SB33 and PAK 12085. Nucleotide sequences were determined for the D15 genes (AAQ66198-202) and the corresponding aa sequences were derived (AAR53754-58). D15 OMP can be produced easily and on a large scale, free of other antiqens and lipooligosaccharides, by recombinant DNA methods using the isolated genes.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          : ||| |-|| | :| | | |-|| | DHRWVVSAKASAGYANGFGNKRLPFYQTYTAGGIGSLRGFAYGSI---GPNAIYAEHGNG 672
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     SKGYFSSKVSLT-----EKDGA-YTVHITPGPRTK-----IANVG--VAILGDILSDG 149
                                                                                                                                                                                                                                                                                                                                                                                        NLAEYYRNALENWQQPVGSDFDQDSWENSKTSVLGAVTRKGYPLAKLCNTRAAVNPD--- 206
                                                                                                                                                                                                                                                                                                                                                                                                     :|::|:
HLNDTFRRS-----GNTTVNSVPDFDD 327
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                QNGHYSGASVQADFDRLQG--DRVPVKVSVTEVKRHKLETGIRLDSEYGLGGKIAYDYYN 323
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      RTGFFE--TVENRIDPINGSNDEVDVVYKVKERNTGSINFGIGYGTESGISYQTSIKQDN 445
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             324 LFNKGYIGSVVWDMDKYETTLAAGISQPR-----NYRGNYWTSNVSYNRS-TTQNLEKR 376
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         377 AFSGGI---WYVRDRAGIDARLG-----AEFLAE-------GRKIPGSDIDLG 414
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              TYGSNVTLGFPVNENNSYYVGLGHTYNKISNFALEYNRNLYIQSMKFKGNGIKTNDFD-- 563
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      415 NSHATMLTASWKRQLLNNVLHPENGHYLDGKIGTTLGTFLSSTALIRTSARAGYFFTPEN 474
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           -----FSFGWNYNSLNRGYFPTKG--VKASLGGRVTIPGSDNKYYKLSADVOGFYPLDR 615
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    673 TFNKISSDVIGGNAITTASAELIVPTPFVSDKSONTVRTSLFVDAASVWNTKWKSDKNGL 732
                                                                                                                                                                                                                                                                                                                       Gaps
                                                                                                                                                                                                                                                                                                                                                                  NNGYAKAQITKTDVQLNDEKTKVNVTIDVNEGLQYDLRSARIIGNLGGMSAELEPLLSAL 287
                                                                                                                                                                                                                                                                                                                                                                                                                                                        ANKTLAITFVVDAGRRLTVRQLRFEGNTVSADSTLRQEMRQQEGTWYNSQLVELGKIRLD 387
                                                                                                                                                                                                                                                                                                                                                                                                                                    -TATVDLNVVVDSGRPIAFGDFEITGTQRYPEQIVSGLARFQPGTPYDLDLLLDFQQALE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  KKLGTFIIRGOAGYTVARDNADVPSGLMFRSGGASSVRGYELDSIGLAGPN-----
                                                                                      Haemophilus influenzae, and related protein - esp. of etc. useful in vaccines, for diagnosis and for passive immunisation.
                                                                                                                                                                                                                                                                                                                       Indels 139;
                                                                                                                                                                                                                                                                                                 DB 15; Length 793;
                       Thomas W;
                                                                                                                                                                                                                                                                                               6.7%; Score 213.5; DB 15;
21.0%; Pred. No. 1.7e-08;
tive 85; Mismatches 254;
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                       Loosmore
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(CONN-) CONNAUGHT LAB
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Matches 127; Conserv
                      Klein M,
                                                                                                                                                                                                                                                                          793 AA;
                                                                                                                                              Disclosure; Fig.
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IGGSF 793
                    Chong P,
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                                                                                                                                                                                                                                                                 Naccine; passive immunization; vector; antiserum; diagnosis; D15;
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21.5%; Pred. No. 3.1e-08;
ive 75; Mismatches 241
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AAR53757 standard; Protein; 792 AA.
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                                       QSMKFKGNGIKTNDFD-----FSFGWNYNSLNRGYFPTKG--VKASLGGRVTIPGSD 597
                                                                       TALIRTSARAGYFFTPENKKLGTFIIRGQAGYTVARDNADVPSGLMFRSGGASSVRGYEL 516
                                                                                                                                                                                         DAASVWNTKWKSDKNGLESNVLKDLPDYG---KSSRTRASTGVGFQWQSPSGPVVFSYAK 771
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FENYDNSKSDTSSNYKRTTYGSNVTLGFPVNENNSYYVGLGHTYNKISNFALEYNRNLYI 547
                                                                                                                                               GSI---GPNAIYQGQNNKFNKISSDVIGGNAIATASAELIVPTPFVSDKSQNTVRTSLFV 714
                                                                                                                        DSIGLAGPN----FTRT----
                                                                                                                                                                           ---LSGAVFHDMGDAAANFKRMKLKHGSGLGVRWFSPLAPFSFDIA-
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Length 797;

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Query Match

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24;
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                                                                                                                                                                                                            ESVSSSTLQEQMELQPDSWWKLWGNKFEGAQFEKDLQSIRDYYLNNGYAKAQITKTDVQL 243
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | |:: | :: | : | : | : | 462 YGTSVNLGYTEPYFTKDGVSLGGNVFPENYDNSKSDTSSNYKRTTYGSNVTLGFPVNENN 521
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    532 RALLVGSLEYQLP-----FTRTLSGAVFHDM-------GDAAANFKRM---- 567
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         NAIATASAELIVPTPFVSDKSQNTVRTSLFVDAASVWNTKWKSDKNGLESDVLKRLPDYG 748
                                                    Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             VGSDFDQDSWENSKTSVLGAVTRKGYPLAKLGNTRAAVNPD----TATVDLNVVVDSGRP
                                                                                                                                                                                                                                                                                                                                                                                  Vaccine; passive immunization; vector; antiserum; diagnosis; D15; OMP; outer membrane protein; NTHi.
                                               Indels 137;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   ---KLKHGSGLGVRWFSPLAPFSFDIA----YGHSDKKIRWHISLGTRF 609
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   KSSRIRASTGVGFQWQSPIGPLVFSYAKPIKKYENDDVE-QFQFSIGGSF 797
                                               Mismatches 280;
    3.7e-08
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         Pred. No.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 H. influenzae b Minn A D15 sequence.
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llarity 20.0%; Pr
Conservative 103;
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    Best Local Similarity
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                                               Matches 130;
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RESULT 29
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      340 YETTLAAGISQPR-----NYRGNYWTSNVSYNRS-TTQNLEKRAFSGGI---WYVRDRA 389
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                GIDARLG-----AEFLAE-----GRKIPGSDIDLGNSHATMLTASWKRQLL 430
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  574 NRGYFPTKG--VKASLGGRVTIPGSDNKYYKLSADVQGFYPLDRDHLWVVSAKASAGYAN 631
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  632 GFGNKRLPFYQTYTAGGIGSLRGFAYGSI---GPNAIYAEYGNGSGTGTFKKISSDVIGG 688
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                                                                                                                                                                                                                                                                                                                                                                                                                                           DSEIKDMVEEHLPLITQQQEEVLDKEQTGFLAEEAPDNVKTMLRSKGYFSSKVSLT---- 116
                                                                                                                                                                                                                                                                                                                                                                                                                                                                        ESVSSSTLQEOMELQPDSWWKLWGNKFEGAQFEKDLOSIRDYYLNNGYAKAQITKTDVQL 243
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         --EKDGA-YTVHITPGPRTK-----IANVG--VAILGDILSDGNLAEYYRNALENWQQP 165
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    166 VGSDFDQDSWENSKTSVLGAVTRKGYPLAKLGNTRAAVNPD----TATVDLNVVVDSGRP 221
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       461
                                                                                                                                                                                                     Outer membrane protein (OMP) D15 genes were isolated by screening chromosomal libraries of H. Influenzae type b (Hib) strains Ca.
Bagan and Minn A, and the non-typeable (NTHi) strains SB33 and PAK 12085. Nucleotide sequences were determined for the D15 genes (AAG66198-202) and the corresponding as sequences were derived (AAR53754-58). D15 OMP can be produced easily and on a large scale, free of other antigens and libooligosaccharides, by recombinant DNA
                                                                                                                                                                                                                                                                                                                                                                                                                 Gaps
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       522 SYYVGLGHTYNKISNFALEYNRNLYIQSMKFKGNGIKTNDFD-----FSFGWNYNSL
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                                                                                        Haemophilus influenzae, and related proteins, vectors, antisera etc. useful in vaccines, for diagnosis and for passive immunisation.
                                                                                                                                                                                                                                                                                                                                                                                                              Indels 137;
                                                                                                                                                                                                                                                                                                                                                                               Length 797;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               ---KLKHGSGLGVRWFSPLAPFSFDIA----YGHSDKKIRWHISLGTRF 609
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Thomas
                                                                                                                                                                                                                                                                                                                                                                           DB 15;
                                                                                                                                                                                                                                                                                                                                                                             Score 208.5; DB 15;
Pred. No. 4.5e-08;
i; Mismatches 280;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   491 ARDNADVPSGLMFRSGGASSVRGYELDSIGLAGPN-----
 DYC,
 Sia
                                                                                                                                                                         Disclosure; Fig. 1C; 161pp; English.
                                                                                                                                                                                                                                                                                                                  methods using the isolated genes
Loosmore S,
                                                                                                                                                                                                                                                                                                                                                                                                            Conservative 103;
                                                                                                                                                                                                                                                                                                                                                                               6.6%;
                                                                                                                                                                                                                                                                                                                                                                                             Similarity
                                            WPI; 1994-200269/24
Klein M,
                                                                                                                                                                                                                                                                                                                                              797 AA;
                                                             N-PSDB; AAQ66200
                                                                                                                                                                                                                                                                                                                                                                                                              datches 130;
 Chong P,
                                                                                                                                                                                                                                                                                                                                                 Sequence
                                                                                                                                                                                                                                                                                                                                                                             Query Match
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                                                                                                                                                                                                                  diagnosis; D15;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      antisera
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                                                                                                                                                                                                                  immunization; vector; antiserum;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Thomas
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Query Match 6.5%; Score 207.5; DB 15; Best Local Similarity 20.0%; Pred. No. 5.5e-08; Matches 130; Conservative 103; Mismatches 280;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Sia DYC,
                                                                                                                                                                                                                                                                                        Haemophilus influenzae type b Ca strain
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Disclosure; Fig. 1A; 161pp; English.
                      AAR53754 standard; Protein; 797 AA
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                                                                                                                                                                  H. influenzae b Ca D15 sequence.
                                                                                                                                                                                                                                        membrane protein;
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AAR53754
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----GRKIPGSDIDLGNSHATMLTASWKRQLL 430
                                                                                      SYYVGLGHTYNKISNFALEYNRNLYIQSMKFKGNGIKTNDFD-----FSFGWYNSL 573
                                                                                                                                 NNVLHPENGHYLDGKIGTTLGTFLSSTALIRTSARAGYFFTPENKKLGTFIIRGQAGYTV 490
340 YETTLAAGISOPR-----NYRGNYWTSNVSYNRS-TTONLEKRAFSGGI---WYVRDRA 389
                                                                                                                                                               574 NRGYFPTKG--VKASLGGRVTIPGSDNKYYKLSADVQGFYPLDRDHLWVVSAKASAGYAN 631
                                                                                                                                                                                                   491 ARDNADVPSGLMFRSGGASSVRGYELDSIGLAGPN----------GSVLPE 531
                                                                                                                                                                                                                                 632 GFGNKRLPFYQTYTAGGIGSLRGFPYGSI --- GPNAIYAEYGNGSGTGTFKKISSDVIGG 688
                                                                                                                                                                                                                                                                                               689 NAIATASPELIVPTPFVSDKSQNTVRTSLFVDAASVWNTKWKSDKNGLESDVLKRLPDYG 748
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      membrane protein having a terminal Phe residue.

The protein may be used in a vaccine to prevent or treat H. pylori infection or to identify H. pylori polypeptide binding compounds. Useful as potential H. pylori life cycle activators or inhibitors. The DNA and probes derived from it may be used for the identification of
                   activator;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        This sequence represents a Helicobacter pylori cell envelope outer
                                                                                                                                                                                                                                                                  RALLVGSLEYQLP------FTRTLSGAVFHDM-------GDAAANFKRM----
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Helicobacter pylori nucleic acid sequences and encoded polypeptide(s) - useful in vaccines to treat or prevent H. pylori infection and for diagnosis of H. pylori infection
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Cytoplasmic; vaccine; prevention; treatment; infection; envelope; identification; bluding compound; bacteria; life cycle; activator. Inhibitor; duodenal ulcer disease; chronic gastritis; diagnosis; cell envelope outer membrane protein; OMP.
                                                                                                                                                                                                                                                                                                                                   ---KLKHGSGLGVRWFSPLAPFSFDIA----YGHSDKKIRWHISLGTRF 609
                                                                                                                                                                                                                                                                                                                                                     349 KSSRIRASTGVGFQWQSPIGPLVFSYAKPIKKYENDDVE-QFQFSIGGSF 797
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       H. pylori ORF 05ep10815_4719175_c1_115 cell envelope OMP.
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                                                                                                                                                                                                                                                                                                                                                                                                                                                  AAWS5729 standard; Protein; 925 AA
                                                                390 GIDARLG-----AEFLAE-----
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96US-0758731.
96US-0736905.
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               acid sequences complementary to the DNA act as antisense sequences and can be used to prevent the translation of H. pylori mRNA. Antibodies against the protein can be used in immunoassays to evaluate the abundance and distribution of H. pylori-specific antigens. The genomic sequence of H. pylori (ATCC 55679) was determined from overlapping contigs generated by mechanically shearing the bacterial DNA. The sequences were analysed for ORF of at least 180 nucleotides, and the predicted coding regions defined by computer evaluation. To identify likely H. pylori antigens for vaccine development, the amino acid sequences predicted from various ORF were analysed for significant homology to other known or exported membrane proteins. Having identified and determined the sequences of interest, particular regions can be isolated from H. pylori by PCR amplification for recombinant polypeptide production, e.g. in E. coli
pylori in a sample and the diagnosis of H. pylori infection. Nucleic
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         825 FGFLTFKTPTRGSFFYNAPTTT----ANFKDYGVVGAGFERATWRASTGLOIEWISPMGP 880
                                                                                                                                                                                                                                                                                                                                                                                                                                                                        186 VTRKGYPLAKLGNTRAAVNPDTATVDLNVVV-----DSGRPIAFGDFEITGTQRYPEQI 239
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   240 VSGLARFQPGTPYDLDLLLDFQQALEQNGHYSGASVQADFDRLQGDRVPVKVSVTEVKRH 299
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      300 KLETGIRLDSEYGLGGKIAYDYYNLFNKGYIGSVVWD-------MDKYETTLAAG- 347
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        QLQFGLGYGSYGGLMLNGSVSERNLFGTGQSMSLYANIATGGGRSYPGMPKGAGRMFAGN 538
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  --ISQPR-----GNYWTSNVSYNRSTTQ 371
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          539 ISLTNPRIFDSWYSSTINLYADYRISYQYIQQGGGFGVNVGRMLGNRTHVSLGYNLNVTK 598
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    372 NLEKRAFSGGIWYVRDRAGID------ARLGAEFLAEGRK--IPGSDIDLG---- 414
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        599 LL----GFSSPL-YNRYYSSVNEVASPRQCSTPASVIINRLSGGRTPLVPESCSSPGAITT 654
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       -----NSHATMLTASWKRQL----LNNVLHPENG----HYLDGKIGTTLGTFLSST 457
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               SPEIKGIWDRDYHTPITSSFTLDVSYDNTDDYYFPRNGVIFSSYATMSGLPSSGTLNSWN 714
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774 VTTVRGFR-----NGSITPKDEFGLWLGGDGIFTASTBLSYGVLKAAKMRLAWFFD 924
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   532 -----RALLVGSLEYQLPFTRTLSGAVFHDMGDAAANFKRMKLKHGSGLGVRWFSPLAP 585
                                                                                                                                                                                                                                                                                                                                                                                                                                  Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           AL---IRTSARACYFFTPENKKLGTFI-----IRGQAGYTVARDNAD--VPSGLMFRSGG
                                                                                                                                                                                                                                                                                                                                                                                                                                Indels 188;
                                                                                                                                                                                                                                                                                                                                                                                    Length 925;
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                                                                                                                                                                                                                                                                                                                                                                                                                              202;
                                                                                                                                                                                                                                                                                                                                                                                 1 5.5%; Score 174; DB 18; Similarity 21.0%; Pred. No. 3.9e-05; 23; Conservative 72; Mismatches 202;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            508 ASSVRGYELDSIGLAGPNGSVLPE-----
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                pylori outer membrane polypeptide.
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                                                                                                                                                                                                                                                                                                                                            925 AA;
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                                                                                                                                                                                                                                                                                                                                                                                                                                Matches 123;
                                                                                                                                                                                                                                                                                                                                              Sequence
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Sequences ABB90526-ABB90715 represent novel proteins from Chlamydla pneumoniae (strain CML029), and ABL91184-ABL91373 represent DNA encoding them. The proteins are predicted to be immunogenic and may therefore be useful in vaccine production and for diagnostic purposes. Chlamydia pneumoniae is a common cause of respiratory disease in humans, and is also involved in the development of cardiovascular diseases such as atherosclerosis, coronary artery disease, carotid artery stenosis, myocardial infarction, cerebrovascular disease, aortic aneurysm, claudication and stroke. The proteins and nucleic acids of the invention may be used in vaccines and pharmaceutical compositions for the prevention or treatment of chlamydial infections, particularly Chlamydia pneumoniae infections. The proteins may also be used in the detection of
                                                                                                                                                                                                                                                                                                                    human respiratory disease; cardiovascular disease; atherosclerosis; coronary artery disease; carotid artery stenosis; myocardial infarction; cerebrovascular disease; aortic aneurysm; claudication; stroke;
                     Novel Chlamydia pneumoniae protein useful in the manufacture of a medicament for treatment or prevention of infection due to Chlamydia, preferably Chlamydia pneumoniae, and for diagnostic purposes
 -----RALLVGSLEYQLPFTRTLSGAVFHDMGDAAANFKRMKLKHGSGLGVRWFSPLAP 585
                                                                                                                                                                                                                                                                                                       Chlamydial infection; antigen; immunogen; vaccine; diagnosis;
                                                                                       LVLIFPIAFFNQWGDGNGKKCKGLCFNPNMNDYTQHFEFSMGTRF
                                                                                                                                                                                                                                                                          ID NO:147.
                                                                ---GHSDKKIRWHISLGTRF
                                                                                                                                                                                                                                                                          Chlamydia pneumoniae cp6576 protein, SEQ
                                                                                                                                                                                                                                                                                                                                                                                                                                                               Location/Qualifiers
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                                                                                                                                                                            ABB90599 standard; Protein; 790
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2000GB-0017047.
2000GB-001983.
2000GB-0019368.
2000GB-002583.
2000GB-002583.
2000GB-0027549.
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                                                                                                                                                                                                                                                                                                                                                                                                     Chlamydia pneumoniae
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N-PSDB; ABL91257.
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                                                                --FSFDIAY---
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  WO200202606-A2.
                                                                                                                                                                                                                                                                                                                                                                      strain CWL029.
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21-JUL-2000; 2
07-AUG-2000; 2
18-AUG-2000; 2
14-SEP-2000; 2
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                                                                                                                                                                                                           ABB90599;
                                                                                                                                                                                                                                                                                                                                                                                                                                                  Peptide
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Protein
 532
                                                                                                                                                             ABB90599
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             23;
                                                                                                                                                                                                                                                                                                                                                                                                                 by Helicobacter pylori. The vaccine contains at least one isolated H. pylori polypeptide, or its fragments, in a carrier, where the carrier is a Salmonella, vibrio cholerae or Shigella vector tontaining a nucleic acid encoding the H. pylori polypeptide. The vaccines induce humoral and cellular immune responses. The vaccines are used to treat or prevent infections by H. pylori. Sequences AAX/5779 to AAX/5837 represent nucleic acid sequences encoding H. pylori outer membrane polypeptides (OMPs) AAY17160 to AAX17218.
                                                                                                                                                                                                                                                                                                                                                                                                    The invention relates to a vaccine for preventing or treating infections
 membrane polypeptide; OMP; vaccine; H. pylori infection; humoral;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              VTRKGYPLAKLGNTRAAVNPDTATVDLNVVV-----DSGRPIAFGDFEITGTQRYPEQI 239
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          VSGLARFQPGTPYDLDLLLDFQQALEQNGHYSGASVQADFDRLQGDRVPVKVSVTEVKRH 299
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  539 LSLTNPRIFDSWYSSTINLYADYRISYQYIQQGGGFGVNVGRMLGNRTHVSLGYNLNVTK 598
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        SPEIKGIWDRDYHTPITSSFTLDVSYDNTDDYYFPRNGVIFSSYATMSGLPSSGTLNSWN 714
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          368 IADKGYAF-----AVVKPDLDKDEKNGLVKVIYRIEVGDMVHINDVIISGNQRTSDRI 420
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   479 OLOFGLGYGSYGGLMLNGSVSERNLFGTGOSMSLYANIATGGGRSYPGMPKGAGRMFAGN 538
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  372 NLEKRAFSGGIWYVRDRAGID------4NLGAEFLAEGRK--IPGSDIDLG---- 414
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774 VTTVRGFR-----NGSITPKDEFGLWLGGDGIFTASTELSYGVLKAAKMRLAWFFD 824
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                599 LL---GFSSPL-YNRYYSSVNEVASPRQCSTPASVIINRLSGGRTPLVPESCSSPGAITT
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Length 925;
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                                                                                                                                                                                                                                                        Smith
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            5.5%; Score 174; DB 20; 21.0%; Pred. No. 3.9e-05; ative 72; Mismatches 202;
                                                                                                                                                                                                                                                                                                                                     Cellular vaccine against Helicobacter pylori
                                                                                                                                                                                                                                                        Noonan BM,
                                                                                                                                                                                                                                                                                                                                                                    Page 243-247; 352pp; English,
                                                                                                                                                                                                                         (GENO-) GENOME THERAPEUTICS CORP.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        ,72;
                                                                                                                                                                                                                                                        Guild BC,
                                                                                                                                                                          97US-0993001.
97US-0959131.
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                  cellular immune response
                                            Helicobacter pylori.
                                                                                                                                                                                                                                                                                    WPI; 1999-326698/27
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Similarity
                                                                                                                                                                                                                                                        Ellis RW,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              925 AA;
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             589
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                                                                                                                                                                                                                                                                                                                                 LGTFIIRGQAGYTVARDNA----DVPSGLMFRSGGASSVRGYELDSIG----LAGPNGSVL 529
                                                                                                                                                                            EEVLDKEQTGFLAEEAPDNVKTMLRSKGYFSSKVSLTEKDGAYTVH-----ITPGPRTK 133
                                                                                                                                                                                                 NDLFEREK--FL--KGLDDLRTYYLKRGYFASSVDYSLEHNOEKGHIDVLIKINEGPCGK 188
                                                                                                                                                                                                                                                                                  : | : | | : | | | ADAI------WISHYDLDDKGNILLYMDIDRGSRYTLGHVHIQGFEVLPKRLIEKQSQVG 302
                                                                                                                                                                                                                                                                                                                                                                 FEITGTQRYPEQIVSGLARFQPGTPYDLDLLLDFQQALEQNGHYSGASV------QA 277
                                                                                                                                                                                                                                                                                                                                                                                       422
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                                                                                                                                                                                                                                                                                                                                                                                                                                                           329 Y-----SYNRST 369
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      370 TONLEKRAFSGGI--WYVRD---RAGIDARLGAEFLAEGRK-IPGSDIDLGNSHATMLTA 423
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        697
                                                                                                        Gaps
                                                                                                                                                    PKVEFSEGK-TNIALHLIAKPSIRNIHISG------NQVVPEHKILKTLQIYR 132
                                                                                                                                                                                                                                                                                                                   ------NPDTATVDLNVVVDSGRPIAFGD 226
                                                                                                                             PAADLSENKAAGFALFKNKSPDTESVKLKPKFPVRIDTQDSEIKDMVEEHLPLITQQ--Q 79
Chlamydia pneumoniae, and the nucleic acids may be used in PCR, bri bri bring assay or blotting techniques for determining Chlamydia pneumoniae gene expression. The present sequence represents a specifically claimed Chlamydia pneumoniae protein of the invention
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             530 SKDYAVQTYGGNVSTTYILNEHLKYGLEYRGSQTSLHEKRKFLLGPNIDSNKGFVSAAGV
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                                                                                                                                                                                                                         -----EYY
                                                                                                                                                                                                                                               IKQLTPSGISRSEKSDIQEFIQTKQHSTTTSWFTGAGLYHPDIVEQDSLAITNYLHNNGY
                                                                                                                                                                                                                                                                                                                                                                                   IKITGNTHTKSDVILHETSLFPGDTFNRLKLEDTEQRLRNTGYFQSVSVYTVRSQLDPMG
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              --SSLLI-SEEFQYPLIRQPNISAFVFLDSGFVGLQEYKISLKDLRSSAGFGLRF 749
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                                                                                 DB 23; Length 790;
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                                                                                                       266;
                                                                             5.5%; Score 173.5; DB 2
20.7%; Pred. No. 3.4e-05;
ive 92; Mismatches 266
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AAY34584-Y35879 represent the proteins encoded by all the open reading frames in the complete genome (see AAX91990) of Chlamydia pneumoniae. C. pneumoniae causes respiratory disease such as pneumonia and bronchitis and is thought to be a contributing factor in heart disease, sarcoldosis, sinusitis, purulent otitis media, erythema nodosum or pharyngitis. The polypeptides encoded by the open reading frames of the C. pneumoniae genome (see AAY34584-Y38879) can be used in immunogenic compositions as vaccines. Vectors containing C. pneumoniae uncleotides sequences can also be used as immunogenic compositions, especially where the vector directs the expression of a neutralising epitope of C. pneumoniae.
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Pred. No. 3.4e-05;
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Genome sequence of Chlamydia pneumoniae
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           This claimed Helicobacter pylori polypeptide, designated GHPO 107, can be used in vaccination methods for preventing or treating Helicobacter infection. 85 Helicobacter polypeptides (see AAW71474-W71558) are claimed, as well as isolated polynuclectides (see AAW52009-93) that encode them. The invention also provides: methods for producing these Helicobacter polypeptides in recombinant host systems, and related expression cassettes, vectors cand transformed or transfected host cells; live vaccine vectors that contain the polynuclectides of the invention and which can be used to prevent or treat Helicobacter infection; therapeutic and/or prophylactic methods involving administration of polynuclectide (concenting the presence of Helicobacter in samples using e.g. the polypeptides or monospecific antibodies; methods for the polypeptides or monospecific antibodies; and methods for
                                    SWKRQLLNNVLHPENG-----HYLDGKIGTTLGTFLS-STALIRTSARAGYFFTPENKK 476
                                                                                      LGTFIIRGQAGYTVARDNA---DVPSGLMFRSGGASSVRGYELDSIG----LAGPNGSVL 529
                                                                                                     -GILKIKGEAQFIKPYSNTTAEGVPVSERFFLGGETTVRGYKSFIIGPKYSATEPQGGL- 702
SKDYAVQTYGGNVSTTYILNEHLKYGLFYRGSQTSLHEKRKFLLGPNIDSNKGFVSAAGV 594
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Helicobacter polynucleotide and polypeptide sequences - useful to treat or prevent gastrointestinal infection
                                                            NLNYDSVDSPRTPTTGIRGGVTFEVSGLGGTYHFTKLSLNSSIYRKLTRK------
                                                                                                                                      PERALLVGSLEYQLPFTR--TLSGAVFHDMGDAAANFKRMKLK---HGSGLGVRW 579
                                                                                                                                                        703 --SSLI-SEEFQYPLIRQPNISAFVFLDSGFVGLQEYKISLKDLRSSAGFGLRF 754
                                                                                                                                                                                                                                                                                                                                   GHPO 107; infection; therapy; diagnosis; vaccine; gastritis;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Miller C;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   ) HUMAN GENOME SCI INC.
) MAX PLANCK GES FOERDERUNG WISSENSCHAFTEN.
) MERIEUX ORAVAX PASTEUR MERIEUX SERUMS.
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Claim 1; Page 86-88; 362pp; English,
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                                                                                                                                                                                                                                                                                                           Helicobacter polypeptide GHPO 107.
                                                                                                                                                                                                                              AAW71477 standard; Protein; 847
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970S-0833457.
970S-0834705.
970S-0881227.
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                                                                                                                                                                                                                                                                                 (first entry)
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Tomb J;
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N-PSDB; AAV52012.
                                                                                                                                                                                                                                                                                                                                                                        Helicobacter pylori.
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Odenbreit S,
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24-JUN-1997;
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           ||:
|RGFR------NGSVTPKDEFGLMLGGDGIFTASTELSYGVLKAAKMRLAWFFDFGFL 750
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         392
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         : | : | | : | : | | : | : | | : | 312 LVKVIYRIEVGDMVYINDVIISGNQRTSDRIIRRELLLGPKDKYNLTKLRNSENSLRRLG 371
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               269 HYSGASVQADFDRLQGDRVPVKVSVTEVKRHKLETGIRLDSEYGLGGKIAYDYYNLFNKG 328
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               546 STPASVIINRLSGGKTPLQPESCSSPGAITTSPEIRGIWDRDYHTPITSSFTLDVSYDNT 605
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               606 DDYYFPRNGVIFSSYATMSGLPSS-----GTLNSWNG--LGGNVRNTKVYGKFAAYHH 656
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     LSSTALIRTSARACYFFTPENKKLGTFIIRGOAGYTVARDNAD--VPSGLMFRSGGASSV 511
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              540 EYQLP-----FTRTLSGAVFHDMGDAAANFKRMKLKHGSGLGVRWFSPLAP--FSFDIA 591
                                                                                                                                                      TQQQEEVLDKEQTGF-----LAEEAPDNVKTMLRSKGYFSSKVSL-TEK--DGAYT 123
                                                                                                                                                                                                         81 TEKEKDGL-KSQMGIKKGDTFDEQKLEHAKTALKTALEGQGYYGSVVEVRTEKVSEGALL 139
                                                                                                                                                                                                                                                         124 VHITPGPRTKIANVGVAI-LGDILSDGNLAEYYRNALENWQQPVGSDFDQDSW----- 175
                                                                                                                                                                                                                                                                                                       140 IVFD-----VNRGDSIYIKQSIYEGS-AKLKRRMIESLSANKQRDFWGWMWGLNDGKL 191
                                                                                                                                                                                                                                                                                                                                                                                                                192 RIDOLEYDSMRIODVYMRRGYLDAHISSPFLKTDFSTHDAKLHYKVKEGIOYRISDILIE 251
                                                                                                                                                                                                                                                                                                                                                                                                                                                                     -----PLAKL------GUTRAAVNPDTATVDLNV 214
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      252 IDNPVVPEKTLEKALKVKRKDVFNIEHLRADAQILKTEIADKGYAFAVVKPDLDKDEKNG 311
                                                                                                      Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        490 IQQGGGFGVNVGRMLGNRTHVSLGYNLNVTKLL---GFSSPL-YNRYYSSVNEVVSPRQC
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                                                                                                                                                                                                                                                                                                                                                               ----ENSKTSVLGAVTRKGY
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                                                ; Score 172.5; DB 19; Length 847;
; Pred. No. 4.5e-05;
91; Mismatches 230; Indels 333;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     329 YIGSVVWD-------MDKYETTLAAG---ISQPR-----
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        RGYELDSIGLAGPNGSVLP--ERALLVGS---------
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     811 FFNQWGDGNGKKCKGLCFNPNMDDYTQHFEFSMGTRF 847
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                                                   5.4%;
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                                                                                                      Conservative
                                                                             Similarity
847 AA;
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                                                                             Local Sim
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AAB46311
                                                                                                Matches
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        detection, prevention and/or treatment of an agent (n), took detection, prevention and/or treatment of microbial infection by:

(1) identifying essential genes (1) and corresponding polypeptides

(1) identifying essential genes (1) and corresponding polypeptides

(1) identifying essential genes (1) and corresponding polypeptides

(1) faretifying compounds that are directed against (11) and

(1) formulating selected (A). Identifying essential genes (1) comprises

(2) formulating selected (A). Identifying essential genes (1) comprises

(3) formulating selected (A). Identifying essential genes (1) comprises

(4) formulating selected (A). Identifying essential genes (1) comprises

(5) formulating valuability and/or survival of the deficient organisms.

(6) the invention have antibacterial activity. (A) (which may be a nucleic acid (Ia), vector or host cell containing (Ia), derived polypeptide (IIa), or fragments, (IIa)-specific antibodies or their collypeptide (IIa) or fragments, (IIa)-specific antibodies or their collypeptide (IIa) are used in DNA, subunit or live vaccines. The method (IIa) and (IIa) are used in DNA, subunit or live vaccines. The method (IIa) and (IIa) are used in DNA, subunit or live vaccines. The method (IIa) and (IIa) are sessential genes, including those that have homologs in other species, so identified (A) should have a broad spectrum of activity. Many gene deficient cells can be screened quickly, in an automated process, and the identified genes can be used for screening without purification.
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          -- GNTRAAVNPDTATVDLNV 214
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                5.4%; Score 172.5; DB 22; Length 916;
20.0%; Pred. No. 5.1e-05;
ive 91; Mismatches 230; Indels 333; Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Preparing an agent for diagnosis or control of microbial infection, useful particularly against Helicobacter, based on identification of essential genes in defective mutants -
                                                Microbial infection; antibacterial; Helicobacter pylori infection;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             This invention describes a novel preparation of an agent (A) for
                                                                                                                                                                                                                                                                                                                                                                                 Meyer TF;
                                                                                                                                                                                                                                                                                                                         PLAC ) MAX PLANCK GES FOERDERUNG WISSENSCHAFTEN.
                                                                                                                                                                                                                                                                                                                                                                                Gibbs CP, Hueck CJ,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Claim 37; Page 236-239; 366pp; German.
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99DE-1027740.
99DE-1034029.
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Best Local Similarity 20.0
Matches 163; Conservative
               H. pylori HPS120 protein.
                                                                                                                                                                                                                                                                                                                                            (CREA-) CREATOGEN GMBH
                                                                                                                                                                                                                                                                                                                                                                              Apfel H, Fuchs TM,
                                                                                                       Helicobacter pylori.
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N-PSDB; AAF25588.
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                                                                       vaccine; screening.
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                                                                                                                                          WO200073502-A2.
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17-JUN-1999;
21-JUL-1999;
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381 LVXVIYRIEVGDMVYINDVIISGNQRTSDRIIRRELLGPKDKYNLTKLRNSENSLRRLG 440
                                                                                                                                                             558
VV-----DSGRPIAFGDFEITGTQRYPEQIVSGLARFQPGTPYDLDLLLDFQQALEQNG 268
                                                              269 HYSCASVQADFDRLQGDRVPVKVSVTEVKRHKLETGIRLDSEYGLGGKIAYDYYNLFNKG 328
                                                                                  RGFR-----NGSVTPKDEFGLWLGGDGIFTASTELSYGVLKAAKMRLAWFFDFGFL 819
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                                                                                                                                                                                                                                                                                                                            -----SHATM--LTASWKRQLLNNVLHPENGHYLDGKIGTT--LGTF---- 453
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                                                                                                                                                                                                                                                                                                                                                                                          454 LSSTALIRTSARAGYFFTPENKKLGTFIIRGQAGYTVARDNAD--VPSGLMFRSGGASSV
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       540 EYQLP-----FTRTLSCAVFHDMGDAAANFKRMKLKHGSGLGVRWFSPLAP--FSFDIA
                                                                                                                             329 YIGSVVWD-----NDKYETTLAAG---ISQPR-----NYR----
                                                                                                                                                             199 QSMSLYANIATGGGRSYPGMPKGAGRMFAGNLSLTNPRIFDSWYSSTINLYADYRISYQY
                                                                                                                                                                                           ------GNYWTSNVSYNRSTTQNLEKRAFSGGIWYVRDRAGID-----
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   CPN100111; Chlamydia infection; immune response; vaccine.
                                                                                                                                                                                                                                                             ---ARLGAEFLAEGR-----KIPGS-----
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Amino acid sequence of the CPN100111 polypeptide.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          880 FFNQWGDGNGKCKGLCFNPNMDDYTQHFEFSMGTRF
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      592 YGH-----SDKKIR-----WHISLGTRF
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1..85
/note= "signal peptide"
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98US-0097188.
98US-0097189.
98US-0097195.
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Chlamydia pneumoniae.
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20-AUG-1998;
20-AUG-1998;
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20-AUG-1998
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99WO-EP03822.
                                                                                                                                                                           AAY44390 standard; Protein;
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                                                                                                                                                                                                                                (first entry)
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                                                                                                                                                                                                                                                                                                                             Moraxella catarrhalis.
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nes 145; Conserv
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                N-PSDB; AAZ29550.
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08-MAR-1999;
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                                                                                                                                                                                                      AAY44390;
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                                                                                                                                                                                                           AAX69362-69 represent chlamydia pneumoniae polypeptides. The polypeptides are present in the bacterial membrane structure, in the external vicinity of the membrane structure, in the inclusion membrane structure, in the inclusion membrane and in the external vicinity of the inclusion membrane structure, used to prevent, treat and detect the presence of chlamydia infection and/or the presence of Chlamydia in sample. The polypeptides may also be used to induce an immune response in a mammal. The vaccine vector comprising the polynucleotides is used to induce an immune response in a mammal. Antibodies directed against the polypeptides
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 :||| :: || |:: || 360 IKITGNTHTKSDVILHETSLFPGDTFNRLKLEDTEQRIRNTGYFQSVSVYTVRSQLDPMG 419
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   SKDYAVQTYGGNVSTTYILNEHLKYGLFYRGSQTSLHEKRKFLLGPNIDSNKGFVSAAGV 586
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 ---DILSDGNLA-----EYY 155
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          RNALENWQQPVGSDFDQDSWEN----SKTSVLGAVTRKGYPL------ 193
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              -----AKLG--NTRAAV----NPDTATVDLNVVVDSGRPIAFGD 226
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           329 Y------IGSVVWDMDKYETTLAAGISQPRNYRGNYWTSNV----SYNRST 369
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      475 FRCLRGGGEHLFLKANFGDKVTDYTLKWT-----KP-HFLNTPWILGIELDKSINRAL 526
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               370 TQNLEKRAFSGGI--WYVRD---RAGIDARLGAEFLAEGRK-IPGSDIDLGNSHATMLTA 423
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      SWKRQLLNNVLHPENG-----HYLDGKIGTTLGTFLS-STALIRTSARAGYFFTPENKK 476
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      PKVEFSEGK-TNIALHLIAKPSIRNIHISG------NQVVPEHKILKTLQIYR 129
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  EEVLDKEQTGFLAEEAPDNVKTMLRSKGYFSSKVSLTEKDGAYTVH-----ITPGPRTK 133
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   ADAI-----VNSHYDLDDKGNILLYMDIDRGSRYTLGHVHIQGFEVLPKRLIEKQSQVG 299
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      300 PNDLYCPDKIWDGAHKIKOTYAKYGYINTNVDVLFIPHATRPIYDVTYEVSEGSPYKVGL 359
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 FEITGTQRYPEQIVSGLARFQPGTPYDLDLLLDFQQALEQNGHYSGASV------QA 277
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      DFDRLQGDRVPVKVSVTE-----VKRHKLETGIRL-DSEYGLGGKIAYDYYNLFNKG 328
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 420 NADQYRDIFVEVKETTTGNLGLFLGFSSLDNLFGGIELSESNFDLFGA-----RNIFSKG 474
                                                                                                                                  Novel antigens and corresponding DNA molecules that can be used to prevent, treat and diagnose disease caused by Chlamydia infection in
                                                                                                                                                                                                                                                                                                                                                                                                                                                                           PAADLSENKAAAGFALFKNKSPDTESVKLKPKFPVRIDTQDSEIKDMVEEHLPLITQQ--Q 79
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              186 IKQLTFSGISRSEKSDIQEFIQTKQHSTTTSWFTGAGLYHPDIVEQDSLAITNYLHNNGY
                                                                                                                                                                                                                                                                                                                                                                                                                      5.3%; Score 169.5; DB 21; Length 787; 20.6%; Pred. No. 7.1e-05; ative 92; Mismatches 267; Indels 209;
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98US-0097191.
                                                                                                                                                  prevent, treat and diagnose mammals, especially humans
                                       (CONN-) CONNAUGHT LAB LTD.
                                                                                                                                                                                                                                                                                                                                                                                                                                                  Matches 147; Conservative
                                                                  Oomen RP;
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                                                                                           2000-224703/19.
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                                                                                                        N-PSDB; AAZ61502
27-AUG-1998;
17-AUG-1999;
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infection.
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   100 KTMLR----SKGYFSSKVSL--TEKDG---AYTVHITPGPRTKIANVGVAILGDILSDGN 150
    636
                                                                                LGTFIIRGQAGYTVARDNADV---PSGLMFRSGGASSVRGYELDSIG----LAGPNGSVL 529
                                                                                                                                                        -GILKIKGEAQFIKPYSNTTAEGDPVSERFFLGGETTVRCYKSFIIGPKYSATEPQGGL- 694
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   VRIDTQDSEIKDMVEEHLPLITQ---QQEEVLDKE--QTGF-----LAEEAPDNV 99
587 NLNYDSVDSPRTPTTGIRGGVTFEVSGLGGTYHFTKLSLNSSIYRKLTRK-----
                                                                                                                                                                                                                                                                                PERALLVGSLEYQLPFTR--TLSGAVFHDMGDAAANFKRMKLK---HGSGLGVRW 579
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         BASB027; OMP85; outer membrane protein; otitis media; treatment; diagnosis; bacterial infection.
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19.4%; Pred. No. 0.00016;
iive 96; Mismatches 260;
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                                                                                                                                                                                                                                                                                                                                                                                                                               254
                                                  264
                                                                          EDKNRIFVEISLHEGEOYRFGOTOFLGNLTYTOAELEALLKFKAEEGFS-----OAML 307
                                                                                                     -----SV 293
                                                                                                                           308 EQTINNISTREGDDGYYYAQIRPVTRINDESRTVDVEYYIDPVHPVYVRRINFTGNFKTQ 367
                                                                                                                                                       334
                                                                                                                                                                                                       WDMDKYETTLAAGISQ-----PRNYRGNYWTSNVSYNRSTTQNLEKRAFSGGIW 383
                                                                                                                                                                                                                      GRF-MGISNVKOLMADGGKIQVDNNGIPDFKHDYTTYNAILGWNYSSLDRPVFPTQGMSH 603
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 LAEYYRNALENWQQPV--GSDFDQD----SWENSKTSVLGAVTRKGYPLAKLGNTRAAVN 204
                       200 LIDVLA-IKDNKINPLSKADRYTQEKLVTSLENLRAKYLNA----GFVRFEIKDAKLNIN
                                                  PDTATVDLNVVVDSGRPIAFGDFEITGTQRYPEQIVSGLARFQPGTPYDLDLLLDFQQAL
                                                                                                                                                     TEVKRHKLETGIRLDSEYGLGGKIAYDYYNLFNKGY---------IGSVV
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                                                                                                                                                                                                                                                                                                           SDIDLGNSHATMLTA------SWRRQLLNNVLHPENG--H
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                                                                                                                                                                                                                                                           -----YVRDRAG-----ID--ARLGAEFLAEGRKIPG
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                                                                                                     --NGHY-----SGASVQADFDRLQGDRVPVKV-
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                                                                            as otitis
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              WDWDKYETTLAAGISQ-----PRNYRGNYWTSNVSYNRSTTQNLEKRAFSGGIW 383
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  484
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             TVNGVSQSLSGYYRKTKYDNKNISNYVLDSYGGSLSYGYPIDENORISFGLNADNTKLHG 544
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   -----SWKRQLLNNVLHPENG--H 440
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             YLDGKIGTTLGTFLSSTALIRTSARAGYFFTPENKKLGTFIIRGQA--GYTVARDNADVP 498
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      SVDLTVG----FGDKTH--QKVVYQGNIYRPFIKK---SVLRGYAKLGY----GNNLP 648
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          ----GSVLPERALLVGSLEYQL 543
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             549 FYENFYAGGYGSVRGYDQSSL---GPRSQAYLTARRGQQTTLGEVVGGNALATFGSELIL 705
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     PLPFKGDWIDQVRPVIFIEGGQVFDTTGMDKQTIDLTQFKDPQATAEQNAKAANRPLLTQ 765
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           ETELTNQY ISQGYYNTEITVKQTMLDGNRVKLDMTFAEGKPARVVDINI - IGNQHFSDAD 199
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          PDTATVDLNVVVDSGRPIAFGDFEITGTQRYPEQIVSGLARFQPGTPYDLDLLLDFQQAL 264
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              EDKNRIFVEISLHEGEQYRFGQTQFLGNLTYTQAELEALLKFKAEEGFS------QAML 307
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           EQTTNNISTKFGDDGYYYAQIRPVTRINDESRTVDVEYYIDPVHPVYVRRINFTGNFKTQ 367
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 294 TEVKRHKLETGIRLDSEYGLGGKIAYDYYNLFNKGY-----------IGSVV 334
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          VRIDTQDSEIKOMVEEHLPLITQ---QQEEVLDKE--QTGF-----LAEEAPDNV 99
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 LAEYYRNALENWQQPV - - GSDFDQD - - - - SWENSKTSVLGAVTRKGYPLAKLGNTRAAVN
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                                                                                                                                                                                                                                                                                                                                                                                                                             Score 165.5; DB 21; Length 813;
Pred. No. 0.00016;
; Mismatches 260; Indels 245;
                                                      Novel BASB027 polynucleotide and polypeptides from Moraxella catarrhalis useful for treating M. catarrhalis infection such
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          SGLMFRSGGASSVRGYELDSIGLAGPN-----
                                                                                                                                   Claim 1; Page 102-104; 109pp; English
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19.4%; Pre
tive 96;
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WPI; 2000-105700/09.
N-PSDB; AAZ29551.
                                                                                                                                                                                                                                                                                                                                                                                                                                                 Similarity
                                                                                                                                                                                                                                                                                                                                                                                           813 AA;
                                                                                                                                                                                                                                                                                                                                                                                                                                                   Best Local Sin
Watches 145;
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NLEKRAFSGGIWY-----VRDRAGIDARLGAEFLAEGRKIPGSDIDLGNSHATMLTA 423
                                                                                                                                                                                                                                                               -----PDLDSNKGFVSAAGLNV
                                                                                                                                                                                                                                                                                                                           . SP9 LYDSIDNPRKPTMGIRSFLNXELSGLGGTYQFTKL-TASGSIYRLLTKKGVLKXRAEAXF
                                                                                                                                                                                                                                                                                                                                                                                                 The invention relates to isolated polynucleotide (I) and polypeptide (II) sequences. (I) is useful as hybridisation probes,
232 TQRYPEQIVSGLARFQPGTPYDLDLLLDFQQALEQNGHYSGAS---VQADFDRLQGD---
                                                                                             ------GNYWTSNVSYNRSTTQ
                                                                                                                                                                                   490 YLFLKANLGDKVTDYTVKWTKPHFLNTPWILGVELDKSINKALSKDYSVDTYGGNISTTY
                                                                                                                                                                                                                                                                                                    -----RQLLNNVLHPENGHYLDGKIGTTLGT---FLSSTALIRTSARAGY
                                                                                                                                                                                                                                                                                                                                                                            469 FFTPENKKLGTFIIRGQAGYTVARDNADVPSGLMFRSGGASSVRGYELDSIG----LAGP
                                                                                                                                                                                                                                                                                                                                                                                                                                                    525 NGSVLPERALLVGSLEYQLPFTRTLSGAVFHDMGDAAANFKRMKLK---HGSGLGVR---
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            New isolated polynucleotide and encoded polypeptides, useful in diagnostics, forensics, gene mapping, identification of mutations responsible for genetic disorders or other traits and to assess
                                 NTHTKHDVILHETSLFPGDTFYRLKLEDTETRLRNTGYFKSVSVYTVRSQLDPLDSNDLY
                                                                          -RVPVKVSVTEVKRHKLETGI-RLDSEYGLGGKIAYDYYNLF-----NKGY-----
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Human; chromosome mapping; gene mapping; gene therapy; forensic food supplement; medical imaging; diagnostic; genetic disorder.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        SEQ ID No 55917; 103pp; English.
                                                                                                                                                                                                                                                           550 ILNDK-LKYGMYYRGSQTSLSLRKKTSSSNRLG---
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Novel human diagnostic protein #25549.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              AA.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            ABG25558 standard; Protein; 371
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Tang YT;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                30-MAR-2001; 2001WO-US08631.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     2000US-0540217.
2000US-0649167.
                                                                                                                                                                                                                                                                                                                                                                                                                 658 I----KPFGTTTAQG-----
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      (first entry)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              ------WFSPLAP 585
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 774
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 MNNVPIMLGWGWPFRP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        WPI; 2001-639362/73
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Liu C,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              (HYSE-) HYSEQ INC
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           N-PSDB; AAS89745.
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23-AUG-2000;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   RT,
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     AAY36754-Y37949 are encoded by open reading frames (ORFS) of the genome of Chlamydia trachomatis (see AAZ01425). The polypeptides can be used as vactines against Chlamydia trachomatis. Antisense and ribozyme sequences can also be used to control growth of the microorganism. Chlamydia trachomatis is responsible for a large number of diseases, e.g. eye plaseases such as conventional trachoma, nonendemic trachoma, and inclusion conjunctivitis; genttal diseases such as nongonococcal uretritis, epidymitis, cervicitis, salpingitis, and venerallymphogranulomatosis. The polypeptides of the invention may be of use in treating these diseases.
                                                                                                                                                                                                                                                                                              Vaccine; eye disease; conventional trachoma; nonendemic trachoma; paratrachoma; inclusion conjunctivitis; genital disease; perhhepatitis; nongonococcal uretritis; epidymitis; cervicitis; salpingitis; bartholinitis; pneumopathy; venereal lymphogranulomatosis.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              T--VHITPGPRTKIANV---GVAILGDILSDGNLAEYYRNALENWQQPVG--SDFDQDSW 175
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   -----VGPNSLYCPDKI 315
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         316 WTGAOKIRSAYARYGYV----NTNVDVSFSAHPTLPVYDVTYRVSEGSPYKIGLIKIKG 370
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    DMVEEHLPLITQQQEEVLDKEQTGFLAEEAPDNVKTMLRSKGYFSSKVS---LTEKDGAY 122
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         ENSKTSVLGAVTRKGYPLAKLGNTRAAV - - - - NPDTATVDLNVVVDSGRPIAFGDFEITG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Length 797;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          5.2%; Score 164; DB 20;
21.8%; Pred. No. 0.00021;
tive 65; Mismatches 247;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         TLLIVVDKGPLYTLGHVHIEGFTALSKRLLDKQLL-----
                                                                                                                                                                                                                                                           Chlamydia trachomatis surface exposed protein.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Genome sequence of Chlamydia trachomatis
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Disclosure; Page 802; 1755pp; English
                                     766 DKQLRYSAGVGATWYTPIGPLSISYA 791
                                                                                                                                                Ā
                 -MKLKHGSGLGVRWFSPLAPFSFDIA
                                                                                                                                                Protein; 797
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           98US-0107077.
97FR-0015041.
97FR-0016034.
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                                                                                                                                                                                                                          (first entry)
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                                                                                                                                                                                                                                                                                                                                                                                             Chlamydia trachomatis
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              WPI; 1999-371125/31.
                                                                                                                                                AAY36955 standard;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Similarity
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       (GEST ) GENSET
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          27-NOV-1998;
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28-NOV-1997;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  17-DEC-1997;
                                                                                                                                                                                                                        07-0CT-1999
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tes 134;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Griffais R;
                                                                                                                                                                                     AAY36955;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Sequence
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polymerase chain reaction (PCR) primers, oligomers, and for chromosome and gene mapping, and in recombinant production of (II). The polymuclocides are also used in diagnostics as expressed sequence tags for identifying expressed genes. (I) is useful in gene therapy techniques (II) is useful in gene therapy techniques to restore normal activity of (II) or to treat disease states involving (II) is useful for generating antibodies against it, detecting or quantitating a polypeptide in tissue, as molecular weight markers and as a food supplement. (II) and its binding partners are useful in medical imaging of sites expressing (II). (I) and (II) are useful in medical clasorders involving aberrant protein expression or biological activity. The polypeptide and polymucleotide sequences have applications in ceresponsible for genetic disorders or other traits to assess biodiversity and to produce other types of data and products dependent on DNA and amino acid sequences. ABG00010-ABG30377 represent novel human classification, but was obtained in electronic format directly from WIPO
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 13;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            231 GKCTKWQFGEWLAPGEVRLAPGATLATPELVASCSTEGLNGLAANFHAELRARLPWHGGA 290
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           355 RGNYW-----TSNVSYNRSTTQNLEKRAFSGGIWYVRDRAGIDARLGAEFLAEGRKI 406
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   407 PGSDIDLGNSHATMLTAS------WKRQLLNNVLHPENGHYLDGKIGTTLGTFLSSTA 458
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                54 KRTDLNDTESDSTTLVASRYWDLSSGWQRAI --- NLRWSLDHFTQGEITNTTMLFYPGVM 110
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             LIRTSARAGYF -----FIRGOA 486
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                                                                                                                                                                                                                                                                                                                                                                                                                            at ftp.wipo.int/pub/published_pct_sequences
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Search completed: November 9, 2002, 01:18:45 Job time: 44 secs

MKPRPVHLNTW----EGFYFDL 308

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APPLICANT: THOMAS, Wayne
APPLICANT: YANG, Yan Ping
APPLICANT: YANG, Yan Ping
APPLICANT: SIA, Dwo Yuan Charles
APPLICANT: KLEIN, Michel
APPLICANT: KLEIN, Michel
TITLE OF INVENTION: HAEMOPHILUS OUTER MEMBRANE PROTEIN
NUMBER OF SEQUENCES: 55
CORRESPONDENCE ADDRESS:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         SYSTEM: PC-DOS/MS-DOS
PatentIn Release #1.0, Version #1.25
                             1: Sim & McBurney
6TH Floor, 330 University Avenue
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                SOFTWARE: FULCATION DATA:
APPLICATION NUMBER: US/08/433,522A
FILING DATE: 12-SEP-1995
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ZIP: M5G 1R7
COMPUTER READABLE FORM:
MEDIUM TYPE: Floppy of
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STREET: 6TH Flc
CITY: Toronto
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      -MODEL-frame+_p2n.model -DEV-x1h
-Q-CQ012_1/1020B_7750/app_query.fasta_1.775
-Q-CQ012_1/102PO_28001/US0857669/runat_05112002_11000B_7750/app_query.fasta_1.775
-Q-CQ012_1/102PO_28001/US080857669/runat_05112002_11000B_7750/app_query.fasta_1.775
-LIGPAS-DO-DENTS-DITS -START-1 -END--1 -MATRIX-blosum62 -TRANS-human40.cd1
-LIGPAS-DOCALIGE-200 -TRE.SCORE-EDCT -THR_MAX-100 -THR_MIN-0 -ALIGN-40
-USER-US09857669_6CGN_1_19_€runat_05112002_110008_7750 *-NCPU-6 -ICPU-3
-NOA-XLPXY -NO_MANP -LARGEORERY -LG_SCORES-O -MATT -LONGLOG -DEV_TIMEOUT-120
-WARN_TIMEOUT-30 -THREADS-1 -XGAPOP-10 -XGAPEXT-0.5 -FGAPOP-6 -FGAPEXT-7
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1 MMIKPTALLLPALFFFPHAY .....IAYGHSDKKIRWHISLGTRF
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/cgn2_6/ptodata/1/ina/6B_COMB.seq:*
/cgn2_6/ptodata/1/ina/PCTUS_COMB.seq:*
/cgn2_6/ptodata/1/ina/Packfiles1.seq:*
                                GenCore version 5.1.3
Copyright (c) 1993 - 2002 Compugen Ltd.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Issued_Patents_NA:*
1: /cgn2_6/ptodata/1/ina/5A_COMB.seq:*
2: /cgn2_6/ptodata/1/ina/5B_COMB.seq:*
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Post-processing: Minimum Match 0% Maximum Match 100% Listing first 45 summaries

Command line parameters:

Database

Minimum DB seq length: 0 Maximum DB seq length: 200000000

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BLOSUM62 Xgapop 10.0, Xgapext Ygapop 10.0, Ygapext Fgapop 6.0, Fgapext Delop 6.0, Delext

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Title: Perfect score: Sequence:

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SUMMARIES	ID	US-08-433-522A-9	US-09-135-1	US-08-942-0	US-08-433-522A-7	US-09-135-10	US-08-945-0	US-08-433-5;	US-09-135-166-1	US-08-942-046-1	US-08-433-5;	US-09-135-166-5	US-08-942-046-5
	Query Match Length DB	2989 3	2989 3	2989 4	2974 3	2974 3	2974 4	2949 3	2949 3	2949 4	2950 3	2950 3	2950 4
œ	Query Match	6.7	6.7	6.7	9.9	9.9	9.9	6.6	9.9	9.9	9.9	9.9	9.9
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	Result No.	1	7	e	ಶ	ഹ	9	7	æ	σ	10	11	12

ATTORNEY/AGENT INFORMATION:
NAME: STEWARY, Michael 1
REGISTRATION NUMBER: 24,973
REFERENCE/DOCKET NUMBER: 1038-434 MIS:jb
TELECOMUNICATION INFORMATION:
TELEPHONE: (416) 595-1155
TELEFAX: (416) 595-1163

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1071 ANTANTGGCTATGCCAAAGCACAAATCACTAAAACGGATGTTCAGCTAAATGATGAAAAA 1130
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 1131 ACAAAAGTTAATGTAACCATTGATGTAAATGAAGGTTTACAGTATGACCTTCGTAGTGCA 1190
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              246 PheGlnProGlyThrProTyrAspLeuAspLeuLeuLeuAspPheGlnGlnAlaLeuGlu 265
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   GlnAsnGlyHisTyrSerGlyAlaSerValGlnAlaAspPheAspArgLeuGlnGly--- 284
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                119 AspGlyAla---TyrThrValHisIleThrProGlyProArgThrLys------
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Mismatches:
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                                                                                                                                                                                                                                    Length:
Matches:
                                                                                                                                                                                                                                                                                                                                                                                            SerLysGlyTyrPheSerSerLysValSerLeuThr-
INFORMATION FOR SEQ ID NO: 9: SEQUENCE CHARACTERISTICS: LENGTH: 2989 base pairs TYPE: nucleic acid sTRANDEDNESS: single TOPOLOGY: linear MOLECULE TYPE: DNA (genomic)
                                                                                                                                                                                                                             6.28e-13
213.50
35.04%
20.99%
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US-08-433-522A-9
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2355 GCTTATGGTAGTATT-----GGGCCTAATGCAATTTATGCCGAACATGGTAATGGT 2405 2466 GAACTTATTGTACCAACTCCATTTGTGAGTGATAAAAGCCAAAATACAGTCCGAACCTCC 2525 1845 ATTTTCTTTGAAAACTACGATAACTCTAAAAGTGATACATCCTCTAACTATAAGCGTACG 1904 1905 ACTTATGGAAGTAATGTTACTTTAGGTTTCCCTGTAAATGAAAATAACTCCTATTATGTA 1964 1965 GGATTAGGCCATACCTATAATTAATTAGTAACTTTGCTCTAGAATATAACGGTAATTA 2024 SerSerThrAlaLeuIleArgThrSerAlaArgAlaGlyTyrPhePheThrProGluAsn TyrTrpThrSerAsnValSerTyrAsnArgSer---ThrThrGlnAsnLeuGluLysArg AsnSerHisAlaThrMetLeuThrAlaSerTrpLysArgGlnLeuLeuAsnAsnValLeu 475 LysLysLeuGlyThrPheIleIleArgGlyGlnAlaGlyTyrThrValAlaArgAspAsn 2235 GATCACCGCTGGGTTGTATCTGCAAAAGCATCTGCAGGATATGCAAATGGTTTTGGAAAC 495 AlaAspValProSerGlyLeuMetPheArgSerGlyGlyAlaSerSerValArgGlyTyr 1526 CTATTTGTTGATGCGGCAAGTGTTTGGAATACTAAATGGAAAATCAGATAAAAATGGATTA SerGlyAlaValPheHisAspMetGlyAspAlaAlaAlaAsnPheLysArgMetLysLeu LysHisGlySerGlyLeuGlyValArgTrpPheSerProLeuAlaProPheSerPheAsp -AsnTyrArgGlyAsn 377 AlaPheSerGlyGlyIle-----TrpTyrValArgAspArgAlaGly1leAspAla ------GlyArgLysIleProGlySerAspIleAspLeuGly 435 HisProGluAsnGlyHisTyrLeuAspGlyLysIleGlyThrThrLeuGlyThrPheLeu 1121 TTCCCAACTAAAGGG-----GTTAAAGCAAGTCTTGGTGGACGAGTTACTATTCCAGGT 2175 TCTGATAACAAATACTACAAACTAAGTGCAGATGTACAGGGTTTCTACCCATTAGACAGA GluTyrGlnLeuPro------GluTyrGlnLeuPro------GAGAGCAAGGTCTTGAAAGACTTACCTGATTATGGC------AAATCAAGCCGTATT 590 Ileala-----TyrGlyHisSerAspLysLysIleArgTrpHisIleSer 2025 TATATTCAATCAATGAAATTTAAAGGTAATGGCATTAAAACAAATGACTTTGAT----515 GluLeuAspSerIleGlyLeuAlaGlyProAsn------394 ArgLeuGly--------AlaGluPheLeuAlaGlu------LeuAlaAlaGlyIleSerGlnProArg-LeuGlyThrArgPhe 609 2079 455 358 549 550 344 g qq ò ò 8 ò ò g ò qq ò qq ŏ q à g ò 5 ò 엄 ò a ò ò g ò q ò g ò ò

2754 ATTGGGGGCTCTTTC 2768

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1491 CAACAAGAAGGAACTTGGTATAATTCACAATTAGTTGAGTTAGGAAAAATTCGCTTAGAT 1550
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                                                                                                                    ---GATATTGCAGATGTAGAAATGCAATTAAAGCAAAACTTGGG-----GAACGA 1325
                                                                                                                                                                                                    1326 GGTTAC----------GGTAACACAACAGTAAATTCTGTACCTGATTTTGACGAT 1370
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 377 AlaPheSerGlyGlyIle-----TrpTyrValArgAspArgAlaGlyIleAspAla 393
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                                                                              170 PheaspGlnAspSerTrpGluAsnSerLysThrSerValLeuGlyAlaValThrArgLys 189
150 AsnLeuAlaGluTyrTyrArgAsnAlaLeuGluAsnTrpGlnGlnProValGlySerAsp 169
                                                                                                                                                                                                                                          ---ThralaThrValAspLeuAsnValValValAspSerGlyArgProIleAlaPheGly
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                                                                                                                                                              190 GlyTyrProLeuAlaLysLeuGlyAsnThrArgAlaAlaValAsnProAsp-
                                   1251 CATTTAAATGATACTTTCCGCCGTAGT
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                                                                       APPLICANT: CHONG, Pele
APPLICANT: THOMAS, Wayne
APPLICANT: YANG, Yan Ping
APPLICANT: SA, Dwo Yuan Charles
APPLICANT: SIA, Dwo Yuan Charles
APPLICANT: KLEIN, Michel
TITLE OF INVENTION: HAEMOPHILUS OUTER MEMBRANE PROTEIN
NUMBER OF SEQUENCES: 55
CORRESPONDENCE ADDRESS:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  119 AspGlyAla -- - TyrThrValHisIleThrProGlyProArgThrLys -
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127
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Patentin Release #1.0, Version #1.25
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Conservative:
Mismatches:
Indels:
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6TH Floor, 330 University Avenue
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APPLICATION NUMBER: US/09/135,166
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APPLICATION NUMBER: 08/433,522
FILING DATE: 12-SEP-1995
CLASSIFICATION:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                ATTORNEY/AGENT INFORMATION:
NAME: STEWART, Michael I
REGISTRATION NUMBER: 24,973
REERENCE/DOCKET NUMBER: 1038
TELECOMMUNICATION INFORMATION:
TELEPHONE: (416) 595-1155
INFORMATION FOR SEQ ID NO: 9:
SEQUENCE CHARACTERISTICS:
LENGTH: 2989 base pairs
              Sequence 9, Application US/09135166
Patent No. 6083743
GENERAL INFORMATION:
                                                                                                                                                                                                                                                                                                                                             COUNTER TEADABLE FORM:
COMPUTER READABLE FORM:
MEDIUM TYPE: Floppy disk
"MEDIUM TYPE: Floppy disk
"MEDIUM TYPE: PC COMPALIBLE
"MEDIUM TYPE: DM-DOS/MS-
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STRANDEDNESS: sing
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SOFTWARE: Patenti
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STREET: 62...
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Best Local Similarity:
                                                                                                                                                                                                                                                                                                                        STATE: Ontario
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 CLASSIFICATION:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      MOLECULE TYPE:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                FILING DATE
                                                                                                                                                                                                                                                               ADDRESSEE:
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LOCATION:
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DB:
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2355 GCTTATGGTAGTATT-----GGGCCTAATGCAATTTATGCCGAACATGGTAATGGT 2405
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2466 GAACTTATTGTACCAACTCCATTTGTGAGTGATAAAAGCCAAAATACAGTCCGAACCTCC 2525
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                                                                                                                                                                                                                                    2295 AAGCGTTTACCGTTCTATCAAACTTATACAGCGGGGGGCATTGGTTCATTACGCGGTTTT 2354
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475 LysLysLeuGlyThrPheIleIleArgGlyGlnAlaGlyTyrThrValAlaArgAspAsn 494
                                                                                                                                                           495 AlaAspValProSerGlyLeuMetPheArgSerGlyGlyAlaSerSerValArgGlyTyr
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Sequence 9. Application US/08942046

| Sequence 9. Application US/08942046
| Patent No. 6264954
| GENERAL INFORMATION:
| APPLICANT: THOMAS, Wayne
| APPLICANT: YANG, Yan Ping
| APPLICANT: LOOSMORE, Sheena
| APPLICANT: SIA, Dwo Yuan Charles
| APPLICANT: File No. 100 No
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                                                                                                                                                                                                                                                                                                                      GluLeuAspSerIleGlyLeuAlaGlyProAsn---
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COMPUTER: IBM PC compatible
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PRIOR APPLICATION DATA:
APPLICATION NUMBER: 08/45
FILING DATE: 12-SEP-1995
CLASSIFICATION: 435
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FRY: Canada
M5G 1R7
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1071 AATAATGGCTATGCCAAAGCACAAATCACTAAAACGGATGTTCAGCTAAATGATGAAAA 1130
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| 1131 ACAAAAGTTAATGTAACCATTGATGTAAATGAAGGTTTACAGTATGACCTTCGTAGTGCA 1190
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Mismatches:
Indels:
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Matches:
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ATTORNEY/AGENT INFORMATION:
NAME: STEWART, Michael I
REGISTRATION NUMBER: 24,973
REFERENCE/DOCKET NUMBER: 1038-
TELEPHONE: (416) 595-1155
TELEPHONE: (416) 595-1163
SEQUENCE CHARACTERISTICS:
LENGTH: 2989 base pairs
TYPE: nucleic acid
STRANDEDNESS: single
TOPOLOGY: linear
TOPOLOGY: linear
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35.04%
20.99%
6.73%
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LOCATION: 390..2768
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Query Match:
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               134 IleAlaAsnValGly-----ValAlaIleLeuGlyAspIleLeuSerAspGlyAsnLeu 151
                                                                                                                                                                                                                                                                                                                    TITLE OF INVENTION: HAEMOPHILUS OUTER MEMBRANE PROTEIN
NUMBER OF SEQUENCES: 55
NORRESPONDENCE SIN & MCBULDARY
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SOFTWARE: Patentin Release #1.0, Version #1.25
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Mismatches:
Indels:
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TELEFAX: (416) 595-1155
TELEFAX: (416) 595-1163
INFORMATION FOR SEQ ID NO: 7:
SEQUENCE CHARACTERISTICS:
LENGTH: 22474 base pairs
TYPE: nucleic acid
TYPE: nucleic acid
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6TH Floor, 330 University Avenue
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Matches:
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APPLICATION NUMBER: US/08/433,522A
FILING DATE: 12-SEP-1995
CLASSIFICATION: 435
                                                                                                                                                                                                               APPLICANT: CHONG, Pele
APPLICANT: THOMAS, Wayne
APPLICANT: YANG, Yan Ping
APPLICANT: LOOSMORE, Sheena
APPLICANT: SIA, DWO Yuan Charles
APPLICANT: KLEIN, Michel
                                                                                                                                                          Sequence 7, Application US/08433522A Patent No. 6013514 GENERAL INFORMATION:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             1253 AATGATACTTTCCGCCGTAGT-----
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MEDIUM TYPE: Floppy disk
COMPUTER: IBM PC COMPATIBLE
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MOLECULE TYPE: DNA (genomic)
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34.88%
21.53%
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M5G 1R7
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Query Match:
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CITY: Toronto
STATE: Ontario
COUNTRY: Canada
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                                                                                                                                           US-08-433-522A-7
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                                                                                                                                                                                                                                   ------TTTTCTTTTGGTTGGAACTATAACAGCCTTAATAGAGGCTAT 2120
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|TCTGATAACAAATACTACAAACTAAGTGCAGATGTACGGGGTTTCTACCCATTAGACAGA 2234
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                                  1665 GGTATTGGTTACGGTACAGAGAGTGGTATCAGTTATCAAACAAGTATTAAACAAGATAAT 1724
                                                                                             1785 GTCAATTTGGGTTATACCGAACCCTATTTACTAAAGATGGTGTAAGTCTTGGTGGAAAT 1844
                                                                                                                                                                                                                                                                                                                                                                                        1965 GGATTAGGCCATACCTATAATAAATTAGTAACTTTGCTCTAGAATATAACCGTAATTTA 2024
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                                                                                                                                                                                                               TyrTrpThrSerAsnValSerTyrAsnArgSer---ThrThrGlnAsnLeuGluLysArg 376
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                                                                                                                                                                                                                                                                                377 AlaPheSerGlyGlyIle-----TrpTyrValArgAspArgAlaGlyIleAspAla 393
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 415 AsnSerHisAlaThrMetLeuThrAlaSerTrpLysArgGlnLeuLeuAsnAsnValLeu 434
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304 GlylleArgLeuAspSerGluTyrGlyLeuGlyGlyLyslleAlaTyrAspTyrTyrAsn 323
                                                                    324 LeuPheAsnLysGlyTyrIleGlySerValValTrpAspMetAspLysTyrGluThrThr 343
                                                                                                                                           ---AsnTyrArgGlyAsn 357
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                                                                                                                                         LeuAlaAlaGlyIleSerGlnProArg--
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|GTTCATTACGCGGTTTTGCTTAT 2356
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| 277 ATTGCAGATGTAGAAAATGCAATTAAAGCAAAAACTTGGG-------GAACGAGGTTAC 1327
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                    208 AlaThrValAspLeuAsnValValValAspSerGlyArgProlleAlaPheGlyAspPhe 227
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                                                                                                                                                                                                                                                                               IleAlaAsnValGly-----ValAlaIleLeuGlyAspIleLeuSerAspGlyAsnLeu 151
                                                                                                                                                                                                                                                                                                                              AlaGluTyrTyrArgAsnAlaLeuGluAsnTrpGlnGlnFroValGlySerAspPheAsp 171
                                                                                                                                                                                                                                                                                                                                                                           172 GlnAspSerTrpGluAsnSerLysThrSerValLeuGlyAlaValThrArgLysGlyTyr 191
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                ProGlyThrProTyrAspLeuAspLeuLeuLeuAspPheGlnGlnAlaLeuGluGlnAsn 267
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Matches:
Conservative:
Mismatches:
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                                                                                                                                                                                                                                    Gaps:
TELEPHONE: (416) 595-1155
TELEFAX: (416) 595-1163
INPORMATION FOR SEQ ID NO: 7:
SEQUENCE CHARACTERISTICS:
LENGTH: 2974 base pairs
TYPE: nucleic acid
STRANDENNESS: single
                                                                                          MOLECULE TYPE: DNA (genomic)
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210.50
34.88%
21.53%
6.63%
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386..2761
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2297 TTACCGTTCTATCAAACTTATACAGCGGGGGGGTTTGGTTCATTACGCGGTTTTGCTTAT 2356
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2408 AAGATAAGTICIGAIGIGGIGGIAAIGCAAICGCIACAGCIAGGGAGAGITAAIT 2467
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Patent No. 6264954
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APPLICANT: CHONG, Pele
                                                                               SerGlyGlyIle----
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US-08-942-046-7
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| ATTGCAGATGTAGAAAATGCAATTAAAGCAAAACTTGGG------GAACGAGGTTAC 1327
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       APPLICANT: YANG, Yan Ping
APPLICANT: LOOSMORE, Sheena
APPLICANT: SIA, Dwo Yuan Charles
APPLICANT: KLEIN, Michel
TITLE OF INVENTION: HAEMOPHILUS OUTER MEMBRANE PROTEIN
NUMBER OF SEQUENCES: 55
CORRESPONDENCE ADDRESS:
                                                                                                                                                                                                                                                          SOFTWARE: Patentin Release #1.0, Version #1.25
CURRENT APPLICATION DATA:
APPLICATION NUMBER: US/08/942,046
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Matches:
Conservative:
Mismatches:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              US-09-857-669-2 (1-609) x US-08-942-046-7 (1-2974)
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                                                                                                                              6TH Floor, 330 University Avenue
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Gaps:
                                                                                                                                                                                                                                                 OPERATING SYSTEM: PC-DOS/MS-DOS
                                                                                                                                                                                                                                                                                                                  CLASSIFICATION: 435
PRIOR APPLICATION DATA:
APPLICATION NUMBER: 08/433,522
FILING DATE: 12-SEP-1995
                                                                                                                                                                                                                                                                                                                                                                                           ATTORNEY/AGENT INFORMATION:
NAME: STEWART, Michael I
REGISTRATION NUMBER: 24,973
REFERENCE/DOCKET NUMBER: 1038
TELECOMMUNICATION INFORMATION:
TELEPHONE: (416) 595-1155
TELEFAX: (416) 595-1163
INFORMATION FOR SEQ ID NO: 7:
SEQUENCE CHARACTERISTICS:
                                                                                                                                                                                                                     : Floppy disk
IBM PC compatible
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       MOLECULE TYPE: DNA (genomic)
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210.50
34.88%
21.53%
6.63%
                                                                                                                  Sim & McBurney
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               LENGTH: 2974 base pairs
THOMAS, Wayne
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             single
                                                                                                                                                                                                      COMPUTER READABLE FORM:
MEDIUM TYPE: Floppy
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386..2761
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              linear
                                                                                                                                                                         COUNTRY: Canada
ZIP: M5G 1R7
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Query Match:
                                                                                                                                                                                                                                                                                                                                                                               CLASSIFICATION:
                                                                                                                                                             STATE: Ontario
                                                                                                                              STREET: 6TH F)
CITY: Toronto
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                                                                                                                                                                                                                                                                                                           FILING DATE
                                                                                                                  ADDRESSEE:
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     LOCATION:
                                                                                                                                                                         COUNTRY:
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667 GGTTACGGTACAGAGAGTGGTATTAGTTATCAAGCAAGTGTCAAACAAGATATTTCTTG 1726
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                                                                                                                                                                                                                                  CGCTTTGAAGGAAATACCGGTTTCTGCTGATAGTACTTTACGTCAGGAAATGCGCCAACAA 1492
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     1727 GGAACAGGGGCGGCAGTAAGTATAGCTGGTACGAAAAATGATTATGGTACGAGTGTCAAT 1786
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                                                                                                                                  GluileThrGlyThrGlnArgTyrProGluGlnIleValSerGlyLeuAlaArgPheGln 247
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GTGCCAACTCCATTTGTGAGTGATAAGAGTCAAAATACAGTCCGAACCTCCCTATTTGTT 2527
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                                                                                                               2528 GATGCGGCAAGTGTTTGGAATACTAAATGGAAATCAGATAAAAATGGATTAGAGAGCAAT 2587
                                                                                                                                                                                                  SerGlyLeuGlyValArgTrpPheSerProLeuAlaProPheSerPheAspIleAla--- 591
                                                                                     -----LeuSerGlyAla 552
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                                                                                                                                           ValPheHisAspMetGlyAspAlaAlaAlaAsnPheLysArgMetLysLeuLysHisGly
                                                                                                                                                                                                                                                                                                                                                                                                                                                         APPLICANT: THOMAS, Wayne
APPLICANT: YANG, Yan Ping
APPLICANT: LOGSWORE, Sheena
APPLICANT: SIA, Dwo Yuan Charles
APPLICANT: KLEIN, Michel
TITLE OF INVENTION: HAEMOPHILUS OUTER MEMBRANE PROTEIN
NUMBER OF SEQUENCES: 55
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COMPUTER: IBM PC compatible
OPERATING SYSTEM: PC-DOS/MS-DOS
SOFTWARE: Patentin Release #1.0, Version #1.25
CURRENT APPLICATION DATA:
APPLICATION NUMBER: US/08/433,522A
FILING DATE: 12-SEP-1995
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           ADDRESSEE: Sim & McBurney
STREET: 6TH Floor, 330 University Avenue
CITY: Toronto
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    1038-434 MIS:jb
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; Patent No. 6013514
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REGISTRATION NUMBER: 24,973
REFERENCE/DOCKET NUMBER: 10
TELECOMMUNICATION INFORMATION:
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TELEFAX: (416) 595-1163
INFORMATION FOR SEO ID NO: 1:
SEQUENCE CHARACTERISTICS:
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ATTORNEY/AGENT INFORMATION:
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MEDIUM TYPE: Floppy
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APPLICANT: CHONG,
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COUNTRY: Canada
ZIP: M5G 1R7
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                           Length:
Matches:
Conservative:
Mismatches:
Indels:
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                           1.67e-12
209.50
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Best Local Similarity:
Alignment Scores:
Pred. No.:
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OB:
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2028 TTACGTGGTTTTGCTTATGGTAGTATT------GGACCTAACGCAATTTATGCCGAA 2078
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                                                                                                                          LeuGluLysArgAlaPheSerGlyGlyIle-----TrpTyrValArgAspArgAla 389
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                                         354 TyrArgGlyAsnTyrTrpThrSerAsnValSerTyrAsnArgSer---ThrThrGlnAsn
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117 -----GluLysAspGlyAla---TyrThrValHisIleThrProGlyProArgThrLys 133
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APPLICANT: CHONG, Pele
APPLICANT: THOMAS, Wayne
APPLICANT: TAOSAORE, Sayne
APPLICANT: SIA, Dwo Yuan Charles
APPLICANT: SIA, Dwo Yuan Charles
APPLICANT: KLEIN, Michel
TITLE OF INVENTION: HAEMOPHILUS OUTER MEMBRANE PROTEIN
NUMBER OF SQUENCES: 55
CORRESPONDENCE ADDRESS:
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130
103
280
137
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STATE: OLICATO
COUNTRY: Canada
ZIP: M5G 1A7
COMPUTER READBLE FORM:
MEDIUW TYPE: Floppy disk
COMPUTER: IBM PC compatible
OPERATING SYSTEM: PC-DOS/MS-DOS
SOFTWARE: Patentin Release #1.0, Version #1.25
CURRENT APPLICATION DATA:
APPLICATION NUMBER: US/09/135,166
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Conservative:
Mismatches:
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                                                                                                                                                                                                  ADDRESSEE: Sim & McBurney
STREET: 6TH Floor, 330 University Avenue
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      1038-829 MIS: jb
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APPLICATION NUMBER: 08/433,522
FILING DATE: 12-SEP-1995
CLASSIFICATION:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       ATTORNEY AGENT INFORMATION:
NAME: STEWART, Michael I
REGISTRATION UNDBER: 24,973
REFERENCE/DOCKET INUBER: 1038
TELECOMMUNICATION INFORMATION:
TELEFAN: (416) 595-1155
TELEFAN: (416) 595-1155
TELEFAN: (416) 595-1155
TELEFAN: (416) 595-1163
INFORMATION FOR SEQ ID NO: 1:
SEQUENCE CHARACTERISTICS:
LENGTH: 2949 base pairs
TYPE: nucleic acid
STRANDENBESS: single
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LOCATION:
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804 AATGATGAAAAAAAAAGTTAATGTAACCATTGATGTAAATGAAGGTTTACAGTATGAC 863 134	146 LeuseraspGlyAsnLeualaGluTyrTyrargAsnAlaLeuGluAsnTrpGlnGlnPro 165 ::: ::: :: :: 924 CTTTCAGCATTACATTTAAATGATATCCGCCGTAGT	166 ValGlySerAspPheAspGlnAspSerTrpGluAsnSerLysThrSerValLeuGlyAla 185 	186 ValthrArgLysGlyTyrProLeuAlaLysLeuGlyAsnThrArgAlaAlaValAsnPro 205 	206 AspThralaThrValAspLeuAsnValValAspSerGlyArgPro 221 	222 IlealaPheGlyAspPheGluIleThrGlyThrGlnArgTyrProGluGlnIleValSer 241 ::: :::	242 GlyLeualaargPheGlnProGlyThrProTyraspLeuaspLeuLeuLeuLeuaspPheGln 261 	262 GlnAlaLeuGluGlnAsnGlyHisTyrSerGlyAlaSerValGlnAlaAspPheAspArg 281 	282 LeuGinGlyAspargValProValLysValSerValThrGluValLysArgHis 299 :::	300 LysLeuGluThrGlyIleArgLeuAspSerGluTyrGlyLeuGlyGlyLysIleAlaTyr 319 ::: ::: ::: ::: 1338 AGTATCAACTTTGGTATTGGTTACGGTACAGAGGTGGTATTAGTTATCAAGCAAG	320 ASPTYLTYRASnLeuPheAsnLysGlyTyrIleGlySerValValTrpAspMetAspLys 339 	340 TyrGluThrThrLeualaalaGlyIleSerGlnProArg	354 TyrargGlyasnTyrTrpThrSerasnValSerTyrasnargSerThrThrGlnasn 372 	373 LeuGluLysargalaPheSerGlyGlyIleTrpTyrValargAspargala 389 :::: :::	390 GlylleAspalaargLeuGly	403	411 IleaspLeuGlyasnSerHisalaThrMetLeuThralaSerTrpLysargGlnLeuLeu 430 	431 AsnasnValLeuHisProGluAsnGlyHisTyrLeuAspGlyLysIleGlyThrThrLeu 450
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2028 TTACGTGGTTTTGCTTATGGTAGTATT------GGACCTAACGCAATTTATGCCGAA 2078
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                                           1848 ACTATTCCAGGTTCTGATAACAAATACTACAAACTAAGTGCAGATGTACAGGGTTTCTAC 1907
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451 GlyThrPheLeuSerSerThrAlaLeuIleArgThrSerAlaArgAlaGlyTyrPhePhe 470
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                                                                                                                                                                                                                                                                                                                                                                                                                                                               532 ArgAlaLeuLeuValGlySerLeuGluTyrGlnLeuPro------------
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Patent No. 6264954

GENERAL INFORMATION:
GENERAL INFORMATION:
APPLICANT: THOMAS, Wayne
APPLICANT: THOMAS, Wayne
APPLICANT: LOOSMORE, Sheena
APPLICANT: LOOSMORE, Sheena
APPLICANT: KLEIN, Michel
TITLE OF INVENTION: HAEMOPHILUS OUTER MEMBRANE PROTEIN
NUMBER OF SEQUENCES: 55
CORRESPONDENCE ADDRESS:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             558 ------GlyAspAlaAlaAlaAsnPheLysArgMet-----
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   545 PheThrArgThrLeuSerGlyAlaValPheHisAspMet------
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MEDIUM TYPE: Floppy disk
COMPUTER: IBM PC COMPATIBLE
OPPERATING SYSTEM: PC-DOS/MS-DOS
SOFTWARE: PatentIn Release #1.0, Version #1.25
APPLICATION NUMBER: US/08/942,046
FILING DATE:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       ADDRESSEE: Sim & McBurney
STREET: 6TH Floor, 330 University Avenue
CITY: Toronto
STATE: Ontario
COUNTRY: Canada
ZIP: M5G 1R7
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            61 AspSerGluIleLysAspMetValGluGluHisLeuProLeuIleThrGlnGlnGlnGlu 80
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Matches:
Conservative:
Mismatches:
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                                                                                                                                                        1038-732 MIS: jb
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CLASSIFICATION: 435
PRIOR APPLICATION DATA:
APPLICATION DATA:
APPLICATION NUMBER: 08/433,522
FILING DATE: 12-SEP-1995
CLASSIFICATION: 435
ATTORNEY/AGENT INFORMATION:
NAME: STEWART, Michael I
REGISTRATION NUMBER: 24,973
REFERENCE/DOCKET NUMBER: 1038-TELEPHONE: (416) 595-1155
TELEPAN: (416) 595-1163
INFORMATION FOR SED ID NO: 1: SEQUENCE CHARACTERISTICS:
LENGTH: 2349 base pairs
TYPE: nucleic acid
TYPE: nucleic acid
                                                     08/433,522
                                                                                                                                                                                                                                                                                                        TOPOLOGY: linear MOLECULE TYPE: DNA (genomic)
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209.50
35.858
20.00%
6.60%
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Pred. No.:
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US-08-942-046-1
                                                                                                                                                                                                                                                                                                                                                          NAME/KEY:
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DB:
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1028 TTACGTGGTTTTGCTTATGGTAGTATT-----GGACCTAACGCAATTTATGCGGAA 2078
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                                                                                                                             1224 ATTCGCTTAGATCGTACAGGTTTCTTCGAA...-ACAGTCGAAAACCGAATTGATCCT 1277
                                                                                                                                                                                                                    1278 ATCAATGGTAGTAATGATGAAGTGGATGTCGTATATAAAGTCAAAGAACGTAACACGGGT 1337
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1079 TATGGTAATGGTAGTAGTACTGGTACTTTTAAGAAGATAAGTTCTGATGTGATTGGTGGT
  GlyLeuAlaArgPheGlnProGlyThrProTyrAspLeuAspLeuLeuLeuAspPheGln
                                                                                      GlnAlaLeuGluGlnAsnGlyHisTyrSerGlyAlaSerValGlnAlaAspPheAspArg
                                                                                                                                                                                                                                                                 300 LysLeuGluThrGlylleArgLeuAspSerGluTyrGlyLeuGlyGlyLysIleAlaTyr
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Oy 545 PheThrArgThrLeuSerGlyAlaValPheHisAspMet	laValPheHisAspMet	557	Que DB:	Query Match: DB:
CCGAACCT	CTTATTTGTTGATGCGGCAAGTGTT	TTGGAATACTAAA 2258)-SII	118-09-857-669-2 (1-6
Oy 558GlyAs;	-GlyAspAlaAlaAsnPheLysArgMet	295	à	
Db 2259 TGGAAATCAGATAAAAATGGATTAGAGAGCGATGTATTAAAAAAGATTGCCTGATTATGGC	AGAGAGCGATGTATTAAAAAGATTG	SCCTGATTATGGC 2318	S 8	111:::
Oy 568LysLeuLysHisGl	-LysLeuLysHisGlySerGlyLeuGlyValArgTrpPheSerProLeuAla	SerProLeuAla 584	<u> </u>	
Db 2319 AAATCAAGCCGTATTCGCGCCTCTACAGGTGTCGAATTCCAATGGCATTTCGTTTTGG	::: ::: RCAGGTGTCGGATTCCAATGGCAA		Oy.	81 GluValLeuA
Qy 585 ProPheSerPheAspIleAla	TyrGlyHisSerAspLysIle	AspLysLysIle 599	<u>අ</u>	943 AAATTATGGG
2379			0y	
Qy 600 ArgTrpHisIleSerLeuGlyThrArgPhe	rArqPhe 609		qa	1003 GATTATTAT
2436			δλ	117GluE
11			qq	1063 AATGATGAAA
RESOLD 10 US-08-433-522A-5 : Sequence 5. Application US/08433522A	3522A		δλ	134
; Patent No. 6013514			Op	1123 CTTCGTAGTG
Ż			δ.	146 LeuSerAspG
YANG, Yan			q _C	1183 CTTTCAGCAT
	arles		δλ	166 ValGlySerA
APPLICANT: KLEIN, MICHEL TITLE OF INVENTION: HAEMOPH	ILCREI HAEMOPHILUS OUTER MEMBRANE PROTEIN	NIS	q _O	1222
58			oy	186 ValThrArgL
; AUDRESSEE: SIM & MCBURNEY ; STREET: 6TH Floor, 330 University Avenue	iversity Avenue		q	: 1264GAAC
; CITY: Toronto ; STATE: Ontario			ò	206 Asp
; COUNTRY: Canada ; ZIP: MSG 1R7			: 6	
; COMPUTER READABLE FORM:			3	
; MEDIUM TYPE: Floppy disk ; COMPUTER: IBM PC compatible	a		δλ	222 IleAlaPheG
OPERATING SYSTEM: PC-DOS/	MS-DOS		qa	1363 TTAACTGTTC
CURRENT APPLICATION DATA:	(41) FOLDION *1.60		Qy	242 GlyLeuAlaA
FILING DATE: 12-SEP-1995	/433,322A		අධ	1423 CAGGAAATGC
; CLASSIFICATION: 435 ; ATTORNEY/AGENT INFORMATION:			٥٨	262 GlnAlaLeuG
<pre>; NAME: STEWART, Michael I ; REGISTRATION NUMBER: 24,973</pre>	73		q _Q	111: 1483 ATTCGCTTAG
; REFERENCE/DOCKET NUMBER: : TELECOMMUNICATION INFORMATIO	1038-434 MIS:jb N:		è	282 Lenglagly
; TELEPHONE: (416) 595-1155 TELEPAX: (416) 595-1153			7 E	
INFORMATION FOR SEQ ID NO: 5:			3	TODIES OF THE PROPERTY OF THE
; SEQUENCE CHARACTERISTICS: ; LENGTH: 2950 base bairs			ΟŸ	300 LysLeuGluT
~ ~			ф	1597 AGTATCAACT
TOPOLOGY: linear			07	320 AspTyrTyrA
FEATURE: ON (genomic)			qq	1657 AAACAAGATA
; LOCATION: 3342724			ογ	340 TyrGluThrT
bligged Correct			qO	1717 TATGGTACGA
	Length: 2950	0	07	354 TyrArgGlyA
Percent Similarity: 35.85% near rocal Similarity: 30.00%	Conservative: 103		qq	1777 CTTGGTGGAA
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-----ThralathrvalaspLeuAsnValValValAspSerGlyArgPro 221
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'GATGCAAATAAAACATTAGCGATAACCCTTGTTGTTGATGCTGGACGACGACGT 1362
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|GATCGTACAGGTTTCTTCGAA-----ACAGTCGAAAACCGAATTGATCCT 1536
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| AAAACAAAAGTTAATGTAACCATTGATGTAAATGAAGTTTACAGTATGAC 1122
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      AspPheAspGlnAspSerTrpGluAsnSerLysThrSerValLeuGlyAla 185
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       LysGlyTyrProLeuAlaLysLeuGlyAsnThrArgAlaAlaValAsnPro 205
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               GlyAspPheGluIleThrGlyThrGlnArgTyrProGluGlnIleValSer 241
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             ArgPheGlnProGlyThrProTyrAspLeuAspLeuLeuLeuAspPheGln 261
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              GluGlnAsnGlyHisTyrSerGlyAlaSerValGlnAlaAspPheAspArg 281
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   ThrGlylleArgLeuAspSerGluTyrGlyLeuGlyGlyLysIleAlaTyr 319
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                                                                                                                                                                                                                                                                                                                                ArgSerLysGlyTyrPheSerSerLysValSerLeuThr------ 116
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                                                                                                                                                                     AGTAGCAGTACATTACAAGAACAAATGGAATTACAACCTGATTCTTGGTGG 942
                                                                                                                                                                                                                            AspLysGluGlnThrGlyPheLeuAlaGluGluAlaProAspAsnValLys 100
                                                                                                                           IleLysAspMetValGluGluHisLeuProLeuIleThrGlnGlnGlnGlnGlu 80
137
                                                                         609) x US-08-433-522A-5 (1-2950)
Indels:
Gaps:
6.60%
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GGTTTTGGAAACAAGCGTTTACCGTTCTATCAAACTTATACAGCGGTGGCATCGGTTCA 2286
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                                            1837 TATAAGCGTACGACTTACGGAAGTAATGTTACTTTTAGGTTTCCCTGTAAATGAAATAAC 1896
                                                                                                                                      1897 TCCTATTATGTAGGATTAGGTCATACCTATAATAAAATTAGTAACTTTGCTCTAGAATAT 1956
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2398 AATGCAATGCTACAGCTAGGGAGAGTTAATTGTGCAACTCCATTTGTGAGGGATAAG 2457
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    ----TrpTyrValArgAspArgAla 389
                                                                                                                                                                                          -----GlyArgLysIleProGlySerAsp 410
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        471 ThrProGluAsnLysLysLeuGlyThrPheIleIleArgGlyGlnAlaGlyTyrThrVal 490
                                                                                          390 GlyIleAspAlaArgLeuGly-----402
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373 LeuGluLysArgAlaPheSerGlyGlyIle-
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Patent No. 6083743
GENERAL INFORMATION:
APPLICANT: CHONG, Pele
APPLICANT: THOWAS, Wayne
APPLICANT: YANG, Yan Ping
APPLICANT: YANG, Yan Ping
APPLICANT: LOOSMORE, Sheena
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US-09-135-166-5
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    61 AspSerGluIleLysAspMetValGluGluHisLeuProLeulleThrGlnGlnGlnGlu 80
APPLICANT: SIA, Dwo Yuan Charles
APPLICANT: KLEIN, Michel
TITLE OF INVENTION: HAEMOPHILUS OUTER MEMBRANE PROTEIN
NUMBER OF SEQUENCES: 55
CORRESPONDENCE ADDRESS:
                                                                                                                                                                  2950
130
103
280
137
24
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Matches:
Conservative:
Mismatches:
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CURRENT APPLICATION DATA:
APPLICATION NUMBER: US/09/135,166
FILING DATE:
CLASSIFICATION:
PRIOR APPLICATION:
APPLICATION NUMBER: 08/433,522
FILING DATE: 12-SEP-1995
CLASSIFICATION:
ATTORNEY/AGENT INFORMATION:
NAME: STEWART, Michael I
REGISTRATION NUMBER: 24,973
REFERENCE/DOCKET NUMBER: 1038-829 MIS:jb
TELECOMMUNICATION INFORMATION:
TELECOMMUNICATION INFORMATION:
TELECOMMUNICATION INFORMATION:
TELECOMMUNICATION INFORMATION:
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                                                                                           ADDRESSEE: Sim & McBurney
STREET: 6TH Floor, 330 University Avenue
CITY: Toronto
STATE: Ontario
COUNTRY: Canada
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TELEFAX: (416) 595-1163
INFORMATION FOR SEQ ID NO: 5:
SEQUENCE CHARACTERISTICS:
LENGTH: 2950 base pairs
TYPE: nucleic acid
STRANDEDNESS: single
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35.85%
20.00%
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Best Local Similarity:
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LOCATION:
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Db 2167 CCATTAGACAGAGATCACCTCTGGGTTGTATCTGCAAAAGCATCTGCAGGATATGCAAAT 222		Oy 511 ValargGlyTyrGluLeuAspSerIleGlyLeuAlaGlyProAsn 525 ::	Oy 526	Qy 532 ArgAlaLeuLeuValGlySerLeuGluTyrGlnLeuPro	545 PheThrArgThrLeuSerGlyAlaValPheHisAspMet	558				CCAATTTAGTAT	US-08-942-046-5; Sequence 5, Application US/08942046; Patent No. 6264954	; GENERAL INFORMATION: ; APPLICANT: CHONG, Pele ; APPLICANT: THOMAS, Wayne , ADDITONUM: VANC VER	TITLE OF INVENTION: HAEMOPHILUS OUTER MEMBRANE PROTEIN UMBER OF SEQUENCES: 55	CORRESPONDENCE ADDRESS: DADRESSEE: Sim & McBurney STREET: 6TH Floor, 330 University Avenue	CITY: Toronto STATE: Ontario	COUNTRY: Calada JIP: M5G 1R7 COMPITTER PERDRAFIF FORM	3 22 0	SOFTWARTING SYSTEM: PC-DOS/MS-DOS SOFTWARE: Patentin Release #1.0, Version #1.25	SAPLICATION NUMBER: US/08/942,046; FILING DATE:	; CLASSIFICATION: 435 ; PRICR APPLICATION DATA:	, APPLICATION NUMBER: 08/433,522
euGluAsnTrpGlnGlnPro	CTTTCAGCATTACATTTAAATGATACTTTCCGGCGGTAGT	1222GATATTGCAGATGTAGAAATGCAATTAAAGCAAAACTTGGA 1263 186 ValThrargLysGlyTyrProLeuAlaLysLeuGlyAsnThrargalaalaValAsnPro 205 1:: 1	AspThrAlaThrValAspLeuAsnValValValAspSerGlyArgPro	<pre>GATITICATIGATIGCAAATAAAACATTAGCGATAACCCTTGTTGTTGATGCTGGACGACGT IlealaPheGlyAspPheGlulleThrGlyThrGlnArgTyrProGluGlnIleValSer :::</pre>	1363 TTAACTGTTCGCCAACTTCGCTTTGAAGGAAATACCGTTTCTGCTGATACCACTTTACGT 1422 242 GlyLeualaargPheGlnProGlyThrProTyrAspLeuAspLeuLeuLeuAspPheGln 261 111 111 1111 111:::::::::::::::::::::	1423 CAGGAAATGCCCCAACAAGAACGTTGGTATAATTCACAATTAGTTGAGTTAGGAAAA 1482 262 GlnalaLeugluglnAsnGlyHisTyrSerGlyAlaSerValGlnAlaAspPheAspArg 281	1483 ATTCGCTTAGATCGTACAGGTTCTTCGAAACAGTCGAAAACCGAATTGATCCT 1536 282 LeuglagyASpArgylProValLysValSerValThrillysArgHis 299	1537 ATCAATGGTAGTAATGAGTGGATGTCGTATATAAAGTCAAAGACGTAACGGGT 1596 300 LysLeuGluThrGlylleArgLeuAspSerGluTyrGlyLeuGlyGlyLysIleAlaTyr 319	597 AGTATCAACTTTGGTATTGGTTACGGTACAGAGAGTGGTATTAGTTATCAAGCAAG	AAATGAT	340 TyrGluThrThrLeualaalaGlyIleSerGlnProArg	354 TyrargGlyasnTyrTrpThrSerAsnValSerTyrAsnArgSerThrThrGlnAsn 372 	TATAAGCGTACGACTTACGGAAGTAATGTTACTTTAGGTTTCCCTGTAAATGAAATAAC	390 GIYIleAspAlaArgLeuGly		1957 AACCGTAATTTATATATTCAATCAATGAAATTTAAAGGTAATGGCATTAAAACAAATGAC 2016		.01/ III.041 11/04/104/104/104/104/104/104/104/104/10		451 GlyThrPheLeuSerSerThrAlaLeuIleArgThrSerAlaArgAlaGlyTyrPhePhe 470	

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GATTATTATTAAATAATGCCTATGCCAAAGCACAAATTACTAAAACGGATGTTCAGCTA 1062
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 CAGGAAATGCGCCAACAAGAAGGAACTTGGTATAATTCACAATTAGTTGAGTTAGGAAAA 1482
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         943 AAATTATGGGGAAATAAATTTGAAGGTGCGCAATTCGAGAAAGATTGCAGTCAATTCGT 1002
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               1123 CTTCGTAGTGCACGCATTATAGGTAATCTGGGAGGTATGTCTGCCGAGCTTGAACCTTTA 1182
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           186 ValThrArgLysGlyTyrProLeuAlaLysLeuGlyAsnThrArgAlaAlaValAsnPro 205
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   81 GluValLeuAspLysGluGlnThrGlyPheLeuAlaGluGluAlaProAspAsnValLys 100
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       -----GluLysAspGlyAla---TyrThrValHisIleThrProGlyProArgThrLys 133
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                61 AspSerGluIleLysAspMetValGluGluHisLeuProLeuIleThrGlnGlnGlnGlu 80
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          883 GAATCTGTTAGTAGCAGTACATTACAAGAACAAATGGAATTACAACCTGATTCTTGGTGG
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                                                                                                                                                                                                                                                                                                                                                                                                                               Matches:
Conservative:
Mismatches:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         US-09-857-669-2 (1-609) x US-08-942-046-5 (1-2950)
                                                1038-732 MIS: jb
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NAME: STEWART, Michael I
REGISTRATION NUMBER: 24,973
REPRENCE/DOCKET NUMBER: 1038-
TELECOMMUNICATION INFORMATION:
TELEPHONE: (416) 595-1163
INFORMATION FOR SEQ ID NO: 5:
SEQUENCE CHARACTERISTICS:
LENGTH: 2950 base pairs
TYPE: nucleic acid
                                                                                                                                                                                                                                                             MOLECULE TYPE: DNA (genomic)
                                                                                                                                                                                                                                                                                                                                                                                                           1.67e-12
209.50
35.85%
20.00%
6.60%
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LOCATION: 334..2724
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Best Local Similarity:
Query Match:
                                                                                                                                                                                              TYPE: nucleic
STRANDEDNESS:
TOPOLOGY: lin
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US-08-942-046-5
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1483 ATTCGCTTAGATCGTACAGGTTTCTTCGAA-----ACAGTCGAAAACCGAATTGATCCT 1536
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                           1777 CTTGGTGGAAATGTTTTCTTTGAAACTACGATAACTCTAAAAGTGATACATCCTCTAAC 1836
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1837 TATAAGCGTACGACTTACGAAGTAATGTTACTTTAGGTTTCCCTGTAAATGAAATAAC 1896
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                                                                                                                                                         300 LysLeuGluThrGlyIleArgLeuAspSerGluTyrGlyLeuGlyGlyLysIleAlaTyr 319
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                                                                 LeuGlnGly-----AspArgValProValLysValSerValThrGluValLysArgHis
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983 AAATTATGGGGAAATAAAATTTGAAGGTGCGCAATTCGAGAAGATTTGCAGTCAATTCGT 1042
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                                                                                                                                                                                                                                        -----GATATTGCAGATGTAGAAAATGCAATTAAAGCAAAACTTGGA--- 1303
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                                                                                                                                                                                                                                                                                          134 ..........IleAlaAsnValGly-----ValAlaIleLeuGlyAspIle 145
                                                                                                                                                                                                                                                                                                                                                                    146 LeuSerAspGlyAsnLeuAlaGluTyrTyrArgAsnAlaLeuGluAsnTrpGlnGlnPro 165
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:::||| :::||| 923 GAATCTGTTAGTAGCATACAAGAACAAATGGAATTACAACCTGATTCTTGGTGG 982
                                                                                                                                                                                                              117 -----GluLysAspGlyAla---TyrThrValHisIleThrProGlyProArgThrLys 133
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| 1523 ATTCGCTTAGATCGTACAGGTTTCTTCGAA-----ACAGTCGAAAAACCGAATTGATCCT
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                                                          GluValLeuAspLysGluGlnThrGlyPheLeuAlaGluGluAlaProAspAsnValLys
                                                                                                                                  101 ThrMetLeuArgSerLysGlyTyrPheSerSerLysValSerLeuThr------
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2518 TGGAAATCAGATAAAAATGGATTAGAGAGCGATGTATTAAAAAGATTGCCTGATTATGGC 2577
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2578 AAATCAAGCCGTATTCGCGCCTCTACAGGTGTCGGATTCCAATGGCAATCTCCTATTGGG 2637
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                                      -----LysLeuLysHisGlySerGlyLeuGlyValArgTrpPheSerProLeuAla 584
                                                                                                                ProPheSerPheAspIleAla------TyrGlyHisSerAspLySIle 599
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  TITLE OF INVENTION: HAEMOPHILUS OUTER MEMBRANE PROTEIN NUMBER OF SEQUENCES: 55
CORRESPONDENCE ADDRESS:
ADDRESSEE: Sim & McBurney
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            2984
130
103
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IBM PC compatible
SYSTEM: PC-DOS/MS-DOS
Patentin Release #1.0, Version #1.25
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Length:
Matches:
Conservative:
Mismatches:
Indels:
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CURRENT APPLICATION DATA:

APPLICATION NUMBER: US/08/433,522A
FILING DATE: 12-SEP-1995
CLASSIFICATION: 435
ATTORNEY/AGENT INFORMATION:
NAME: STEMARY, Michael I
RECISTRATION NUMBER: 24,973
REFERENCE/DOCKET NUMBER: 1038-434 MIS:jb
TELECPHONE: (416) 595-1165
TELEPHONE: (416) 595-1165
INFORMATION FOR SEQ ID NO: 3:
SEQUENCE CHARACTERISTICS:
LENGTH: 2984 base pairs
TYPE: nucleic acid
STRANDENESS: single
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             US-09-857-669-2 (1-609) x US-08-433-522A-3 (1-2984)
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                                                                                                                                                                                                                2695 CAGTTCCAATTTAGTATTGGAGGTTCTTTC 2724
                                                                                                                                                                                          600 ArgTrpHisIleSerLeuGlyThrArgPhe 609
                                                                                                                                                                                                                                                                                                      Sequence 3, Application US/08433522A Patent No. 6013514 GENERAL INFORMATION:
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APPLICANT: THOMAS, Wayne
APPLICANT: YANG, Yan Ping
APPLICANT: LOOSWORE, Sheena
APPLICANT: SIA, DWO YUAN CHARLES
APPLICANT: KLEIN, Michel
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209.50
35.85%
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374..2764
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    : Ontario
RY: Canada
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                ; LOCATION:
US-08-433-522A-3
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1937 TCCTATTATGTAGGATTAGGTCATACCTATAAAATTAGTAACTTTGCTCTAGAATAT 1996
                                                                  1997 AACCGTAATTTATATTCAATCAATGAAATTTAAAGGTAATGGCATTAAAACAAATGAC 2056
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                                                                                                   411 IleAspLeuGlyAsnSerHisAlaThrMetLeuThrAlaSerTrpLysArgGlnLeuLeu
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APPLICANT: THOMAS, Wayne
APPLICANT: THOMAS, Wayne
APPLICANT: LOSSWOE, Yan Ping
APPLICANT: LOSSWOE, Sheena
APPLICANT: LOSSWOE, Sheena
APPLICANT: KLEIN, Michel
TITLE OF INVENTION: HAEMOPHILUS OUTER MEMBRANE PROTEIN
WUMBER OF SEQUENCES: 55
CORRESPONDENCE ADDRESS:
ADDRESSEE: Sim & McBurney
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1103 AATGATGAAAAACAAAAGTTAATGTAACCATTGATGTAAATGAAGGTTTACAGTATGAC 1162
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             81 GluValLeuAspLysGluGlnThrGlyPheLeuAlaGluGluAlaProAspAsnValLys 100
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              166 ValGlySerAspPheAspGlnAspSerTrpGluAsnSerLysThrSerValLeuGlyAla 185
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       923 GAATCTGTTAGTAGCAGTACATTACAAGAACAAATGGAATTACAACCTGATTCTTGGTGG 982
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   61 AspSerGluIleLysAspMetValGluGluHisLeuProLeuIleThrGlnGlnGlu 80
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       983 AAATTATGGGGAAATAAATTTGAAGGTGCGCAATTCGAGAAAGATTGCAGTCAATTGGT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             101 ThrMetLeuArgSerLysGlyTyrPheSerSerLysValSerLeuThr------
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130
103
280
24
                                                                                                                  MEDIUM TYPE: Floppy disk
COMPUTER: IBM PC compatible
OPERATING SYSTEM: PC-DOS/MS-DOS
SOFTWARE: Patentin Release #1.0, Version #1.25
CURRENT APPLICATION DATA:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Matches:
Conservative:
Mismatches:
                                                                                                                                                                                                                                                         CLASSIFICATION:
PRIOR APPLICATION DATA:
PRIOR APPLICATION NUMBER: 08/433,522
ELILORIG DATE: 12-SEP-1995
CLASSIFICATION:
NAME: STEWART INFORMATION:
NAME: STEWART, MICHAGE! I
REGISTRATION NUMBER: 24,973
REFERENCE/DOCKET NUMBER: 1038-829 MIS: jb
TELECOMMUNICATION INFORMATION:
TELEFAX: (416) 595-1165
TELEFAX: (416) 595-1165
SEQUENCE CHARATERISTICS:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          US-09-857-669-2 (1-609) x US-09-135-166-3 (1-2984)
6TH Floor, 330 University Avenue
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Gaps:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   LENGTH: 2984 base pairs
TYPE: nucletc acid
STRANDEDNESS: single
TOPOLOGY: linear
MOLECULE TYPE: DNA (genomic)
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209.50
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                                          Ontario
: Canada
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Best Local Similarity:
                       : Toronto
                                                                            ZIP: M5G 1R7
                                                                                                                                                                                                                                               FILING DATE:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             NAME/KEY:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Alignment Scores:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   ; LOCATION:
US-09-135-166-3
                                                             COUNTRY:
                     CITY:
STATE:
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λ̈́o	186 ValThrArgLysGlyTyrProLeuAlaLysLeuGlyAsnThrArgAlaAlaValAsnPro 205	
Dp	1304GAACGCGGTAACGGTAGCGTAACGGTAAATTCAGTACCT 1342	TTACGTGGT
ò	206 AspThralaThrValAspLeuAsnValValValAspSerGlyArgPro 221	ОУ 526
q		Db 2378 TATGGTAATGGTAGTGGTACTGGTACTTTTAAGAAGA
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qq	::: 1403 TTAACTGTTCGCCAACTTCGCTTTGAAGGAAATACCGTTTCTGCTGATAGCACTTTACGT 1462	2438
ò	GlyLeuAlaArgPheGlnProGlyThrProTyrAspLeuAspLeuLeuLeuAspPheGln	OY 54.5 FREEINALSHIP TO THE THIRD TANDAL THE THIRD TANDAL TO THE THIRD THE THIRD THE
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ò	LeuGlnGlyAspArqValProValLysValSerValThrGluValLysArqHis	Qy 568LysLeuLysHisGlySerGlyLeuGlyV
Op		2618
٥٨	300 LysLeuGluThrGlyIleArgLeuAspSerGluTyrGlyLeuGlyGlyLysIleAlaTyr 319	585
g	1637 AGTATCAACTTTGGTTTGGTTACGGTACAGAGAGTGGTATTAGTTATCAAGCAAG	26/8 CCATTGGTATTCTCTTATGCCAAACCAATTA
ò	320 ASPTYTTYTASNLeuPheAsnLySGlyTyTlleGlySerValValTrpAspMetAspLys 339	Oy 600 ArgTrpHislleSerLeuGlyThrArgPhe 609 1:::::
q	1697 AAACAAGATAATTICTIGGGAACAGGGGGGGGGTAAGTATAGCIGGTACGAAAATGAI 1756)
Š a	340 TyrGluThrThrLeuAladlyIleSerGlnProArg	.KESULT 15 US-08-942-046-3 ; Sequence 3, Application US/08942046 : Parent No. 6,564954
à		GENERAL INCOMATION:
<u>a</u>	534 IYIAIGUJYASITYITIDINISHETIYABBAIGSEF-"INTHICLIABN 3/2 	; APPLICANT: CHONG, Pele ; APPLICANT: THOMAS, Wayne ; APPLICANT: YANG, Yan Pinq
ò	373 LeuGluLysArgAlaPheSerGlyGlyIleTrpTyrValArgAspArgAla 389	APPLICANT: APPLICANT:
qq	::::::: 1877 TATAAGCGTACGACTTACGGAAGTAATGTTACGTTTCCCTGTAAATGAAAATAAC 1936	APPLICANT: TITLE OF INV
ò	390 GlyileAspAlaArgLeuGlyAlaGluPheLeuAlaGlu 402	NUMBER OF S CORRESPONDE
g	1937 TCCIATTATGTAGGATTAGGTCATACCTATAATAAAATTAGTAACTTTGCTCTAGAATAT 1996	<pre>; ADDRESSEE: Sim & McBurney ; STREET: 6TH Ploor, 330 University Avenu</pre>
ð	403	
g		COUNTRY: Canada
ò	411 IleAspLeuGlyAsnSerHisAlaThrWetLeuThrAlaSerTrpLysArgGlnLeuLeu 430	; COMPUTER READABLE FORM: ; MEDIUM TYPE: Floppy disk
qq	111 :: 2057 TTTGATTTTTCTTTTGGTTGGAACTATAACAGCCTT 2092	<pre>; COMPUTER: IBM PC compatible ; OPERATING SYSTEM: PC-DOS/MS-DOS</pre>
ŏ	431 AsnAsnValLeuHisProGluAsnGlyHisTyrLeuAspGlyLysIleGlyThrThrLeu 450	<pre>; SOFTWARE: PatentIn Release #1.0, Versic ; CURRENT APPLICATION DATA:</pre>
Q	:::	; APPLICATION NUMBER: US/08/942,046 ; FILING DATE:
ò	451 GlyThrPheLeuSerSerThrAlaLeuIleArgThrSerAlaArgAlaGlyTyrPhePhe 470	; CLASSIFICATION: 435 ; PRIOR APPLICATION DATA:
qq	1147 ACTATICCAGGITCIGAIAACAAAIACTACAAACTAAGIGCAGAIGIACAGGGITICTAC 2206	; APPLICATION NUMBER: 08/433,522 ; FILING DATE: 12-SEP-1995
ζ	471 ThrProGluAsnLysLysLeuGlyThrPheIleIleArgGlyGlnAlaGlyTyrThrVal 490	; CLASSIFICATION: 435 ; ATTORNEY/AGENT INFORMATION:
q	:::	٠.
δy	491 AlaArgAspAsnAlaAspValProSerGlyLeuMetPheArgSerGlyGlyAlaSerSer 510	; REFERENCE/DOCKET NUMBER: 1038-732 MIS: ; TELECOMMUNICATION INFORMATION:
q	2267 GGTTTTGGAAACAAGGGTTTACGTTCTATCAAACTTATACAGGGGTGGCATGGGTTCA 2326	; TELEPHONE: (416) 595-1155 ; TELEFAX: (416) 595-1163

-----GlySerValLeuProGlu 531 |||::: ATAAGITCTGATGTGATTGGTGGT 2437 111 CCAACTCCATTTGTGAGCGATAAG 2497 PheLysargMet------567 ||||||||:: |TaaaaagaTrGCCTGATTATGGC 2617 ValArgTrpPheSerProLeuAla 584 :::111 | |||||||:: rtccaarggcaatctctattgg 2677 TyrGlyHisSerAspLysLysIle 599 ||| ::: ||| ::: |TATGAAAATGATGATGTCGAA--- 2734 SCGCCAAGTGTTTGGAATACTAAA 2557 4et----- 557 MBRANE PROTEIN on #1.25 ąί ě

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1523 ATTCGCTTAGATCGTACAGGTTTCTTCGAA-----ACAGTCGAAAACCGAATTGATCCT 1576
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        983 AAATTATGGGGAAATAAATTTGAAGGTGCGCAATTCGAGAAAGATTGCAGTCAATTCGT 1042
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         1043 GATTATTATATAATAATGGCTATGCCAAAGCACAAATTACTAAAACGGATGTTCAGCTA 1102
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           1403 TTAACTGTTCGCCAACTTCGCTTTGAAGGAAATACCGTTTCTGCTGATAGCACTTTACGT 1462
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       1103 AATGATGAAAAACAAAAGTTAATGTAACCATTGATGTAAATGAAGGTTTACAGTATGAC 1162
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  .......IleAlaAsnValGly-----ValAlaIleLeuGlyAspIle 145
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  146 LeuSerAspGlyAsnLeuAlaGluTyrTyrArgAsnAlaLeuGluAsnTrpGlnGlnPro 165
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               166 ValGlySerAspPheAspGlnAspSerTrpGluAsnSerLysThrSerValLeuGlyAla 185
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 186 ValThrArgLysGlyTyrProLeuAlaLysLeuGlyAsnThrArgAlaAlaValAsnPro 205
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                242 GlyLeuAlaArgPheGlnProGlyThrProTyrAspLeuAspLeuLeuLeuLeuAspPheGln 261
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   LeuGlnGly-----AspArgValProValLysValSerValThrGluValLysArgHis 299
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 GluValLeuAspLysGluGlnThrGlyPheLeuAlaGluGluAlaProAspAsnValLys 100
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  -----GluLysAspGlyAla---TyrThrValHisIleThrProGlyProArgThrLys 133
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                206 Asp------ThralaThrValAspLeuAsnValValAspSerGlyArgPro 221
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  222 IlealaPheGlyAspPheGluIleThrGlyThrGlnArgTyrProGluGlnIleValSer 241
                                                                                                                                                                                                                                                                                                                                                                                                                                                               61 AspSerGluIleLysAspMetValGluGluHisLeuProLeuIleThrGlnGlnGlnGlu 80
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 GlnAlaLeuGluGlnAsnGlyHisTyrSerGlyAlaSerValGlnAlaAspPheAspArg
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           101 ThrMetLeuArgSerLysGlyTyrPheSerSerLysValSerLeuThr-
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103
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137
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Matches:
Conservative:
Mismatches:
Indels:
Gaps:
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INFORMATION FOR SEQ ID NO: 3:
SEQUENCE CHARACTERISTICS:
LENGTH: 2984 base pairs
TYPE: nucleic acid
STRANDENNESS: single
TOPOLOGY: linear
MOLECULE TYPE: DNA (genomic)
                                                                                                                                                                                                                                                                1.7e-12
209.50
35.85%
20.00%
6.60%
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374..2764
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Best Local Similarity:
Query Match:
                                                                                                                                                                     ; NAME/KEY:
; LOCATION:
US-08-942-046-3
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2677	3 AAATCAAGCGTATTCGCGCCTCTACAGGTGTCGGATTCCAATGCCAATCTCTATTGGG	2618	q
584	3LysLeuLysHisGlySerGlyLeuGlyValArgfrpPheSerProLeuAla	26B	ò
2617	TGGAAATCAGATAAAAATGGATTAGAGAGCGATGTATTAAAAAGATTG	ו ומ	· 8
2557	B AGCCAAAATACGGTCCGGACCTCCTTATTTGTTGATGCGGCAAGTGTTTGGAATACTAAA	2496	9 3
ro.	PheThrArgThrLeuSerGlyAlaValPheHisAspMet	54	ò
2497	æ	2438	QQ
544	2 ArgAlaLeuLeuValGlySerLeuGluTyrGlnLeuPro	532	ò
2437	8 TATGGTAATGGTAGTGGTACTGTATTTTAAGAAGATAAGTTCTGATGTTGATGGTGGT	2378	QQ
531		526	ογ
2377	TTACGTGGTTTTGCTTATGGTAGTAT	2327	g
525	ValArgGlyTyrGluLeuAspSerIleGlyLeuAlaGlyPr	511	ŏ
2326		2267	qq
510	AlaArgAspAsnAlaAspValProSerGlyLeuMetPheArgSerGlyGlyAlaSerSe	491	ò
2266	::: 	2207	QQ
490	ThrProGluAsnLysLysLeuGlyThrPheIle1leArgGly(471	à
2206	::: ACTATTCCAGGTTCTGATAACAAATACTACAAACTAAGTGCAGATGTACAGGGT	2147	QQ
470	GlyThrPheLeuSerSerThrAlaLeuIleArgThrSerAlaArgAlaGlyTyrPhePh	451	οχ
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	100111 1001111 10000000101000011000111101111	3 6	3 8
430	IleAspLeuGlyAsnSerHisAlaThrMetLeuThrAlaSerTrp	411	ò
2056	7 AACCGTAATTTATATATTCAATGAAATTTAAAGGTAATGGCATTAAAACAAATGC	1997	Op
410	ysile	403	ò
1996	TCCTATTATGTAGGATTAGGTCATACCTATAAT	1937	g
402	0 GlylleAspAlaArgLeuGlyAlaGluPheLeuAlaGlu	390	õ
1936	TATAAGCGTACGACTTACGGAAGTAATGTTACTTTAGGTTTCCCTGTAAATGAAATAAC	1877	QQ
389		373	ò
1876	CTTGGTGGAAATGTT	1817	CC
372	TyrArgGlyAsnTyrTrpThrSerAsnValS	354	ολ
1816		1757	Q
353	TyrGluThrThrLeuAlaAlaGlyIleSerGlnProArgAg	340	ογ
1756		1697	Q
339	0 AspTyrTyrAsnLeuPheAsnLysGlyTyrIleGlySerValValTrpAspMetAspLys	320	οy
9	AGTATCAACTTTGGTATTGGTTACGGTACAGAGAGTGGTATTAGTTATCAAGTG	1637	Op
319	uThrGlyIleArgLeuAspSerGluTyrGlyLeuGlyGlyLysIleAl	300	ογ

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1058 GATTATTATATAATAGCTATGCCAAAGCACAAATTACTAAAACGGATGTTCAGCTA 1117
                                CCATTGGTATTCTCTTATGCCAAACCAATTAAAAAATATGAAAATGATGATGTGTCGAA--- 2734
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  ----TyrGlyHisSerAspLysLysIle 599
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                                                                                                                                                                                                                                                                   APPLICANT: CHONG, Pele
APPLICANT: THOMAS, Wayne
APPLICANT: YANG, Yan Ping
APPLICANT: LOCSWORE, Sheena
APPLICANT: SIA, Dwo Yuan Charles
APPLICANT: KLEIN, Michel
TITLE OF INVENTION: HAEMOPHILUS OUTER MEMBRANE PROTEIN
NUMBER OF SEQUENCES: 55
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     2987
130
103
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137
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CUBRENT APPLICATION DATA:
APPLICATION NUMBER: US/08/433,522A
FILING DATE: 12-SEP-1995
CLASSIFICATION: 435
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Length:
Matches:
Conservative:
Mismatches:
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 6TH Floor, 330 University Avenue
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              1038-434 MIS: jb
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                                                                                                        2735 CAGTICCAATTTAGTATTGGAGGTICTTTC 2764
                                                                                600 ArgTrpHisIleSerLeuGlyThrArgPhe 609
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COMPUTER: IBM PC compatible
OPERATING SYSTEM: PC-DOS/MS-DOS
                                                                                                                                                                                                          Sequence 55, Application US/08433522A Patent No. 6013514
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               CLASSILICATION: 43.3
ATTORNEY/AGENT INFORMATION:
NAME: STEWART, MICHAEL I
REGISTRATION NUMBER: 24,973
REFRENCE/COCKET NUMBER: 1038
TELECOMMUNICATION INFORMATION:
TELEPHONE: (416) 595-1155
TELEFAX: (416) 595-1163
INFORMATION FOR SEQ ID NO: 55:
SEQUENCE CHARACTERISTICS:
LENGTH: 2947 base pairs
TYPE: nucleic acid
STRANDEDNESS: single
585 ProPheSerPheAspIleAla----
                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Sim & McBurney
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35.85%
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6.60%
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ADDRESSEE: SIM & MCE
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ZIP: M5G 1R7
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Best Local Similarity:
Query Match:
DB:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             STATE: Ontario
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 STREET: 6TH F?
CITY: Toronto
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-----GATATTGCAGATGTAGAAATGCAATTAAAGCAAAACTTGGA--- 1318
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   1952 TCCTATTATGTAGGATTAGGTCATACCTATAATAAAATTAGTAACTTTGCTCTAGAATAT 2011
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                                        1118 AATGATGAAAAAACAAAAGTTAATGTAACCATTGATGTAAATGAAGGTTTACAGTATGAC 1177
                                                                                                          CTTCGTAGTGCACGCATTATAGGTAATCTGGGAGGTATGTCTGCCGAGCTTGAACCTTA 1237
                                                                                                                                                                                                                                                                                                                                                                      1418 TTAACTGTTCGCCAACTTCGCTTTGAAGGAAATACCGTTTCTGCTGATAGCACTTTACGT 1477
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        1592 ATCAATGGTAGTAATGATGAAGTGGATGTCGTATATAAAGTCAAAGAACGTAACACGGGT 1651
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               TyrGluThrThrLeuAlaAlaGlyIleSerGlnProArg-------Asn 353
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                354 TyrArgGlyAsnTyrTrpThrSerAsnValSerTyrAsnArgSer---ThrThrGlnAsn 372
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               373 LeuGluLysArgAlaPheSerGlyGlyIle-----TrpTyrValArgAspArgAla 389
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      1892 TATAAGCGTACGACTTACGGAAGTAATGTTACTTTAGGTTTCCCTGTAAATGAAAATAAC 1951
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              411 IleAspLeuGlyAsnSerHisAlaThrMetLeuThrAlaSerTrpLysArgGlnLeuLeu 430
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                                                                                 LeuSerAspGlyAsnLeuAlaGluTyrTyrArgAsnAlaLeuGluAsnTrpGlnGlnPro 165
                                                                                                                                                                                                                                                 166 ValGlySerAspPheAspGlnAspSerTrpGluAsnSerLysThrSerValLeuGlyAla 185
                                                                                                                                                                                                                                                                                                                                186 ValThrArgLysGlyTyrProLeuAlaLysLeuGlyAsnThrArgAlaAlaValAsnPro 205
                                                                                                                                                                                                                                                                                                                                                                                                               Asp-----ThralaThrValAspLeuAsnValValValAspSerGlyArgPro 221
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               242 GlyLeuAlaArgPheGlnProGlyThrProTyrAspLeuAspLeuLeuLeuAspPheGln 261
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               300 LysLeuGluThrGlyIleArgLeuAspSerGluTyrGlyLeuGlyGlyLysIleAlaTyr 319
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                AspTyrTyrAsnLeuPheAsnLysGlyTyrIleGlySerValValTrpAspMetAspLys 339
  -----GluLysAspGlyAla---TyrThrValHisIleThrProGlyProArgThrLys 133
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                222 IlealaPheGlyAspPheGluIleThrGlyThrGlnArgTyrProGluGlnIleValSer
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2342 TTACGTGGTTTTGCTTATGGTAGTATT------GGACCTAACGCAATTTATGCCGAA 2392
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         2513 AGCCAAAATACGGTCCGAACCTCCTTATTTGTTGATGCGGCAAGTGTTTGGAATACTAAA 2572
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             2573 TGGAAATCAGATAAAAATGGGTTAGAGGGGTGTATTAAAAAGATTGCCTGATTATGGC 2632
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                                            2108 AATAGAGGCTATTTCCCAACTAAAGGG-----GTTAAAGCAAGTCTTGGTGGACGAGTT 2161
                                                                                                                                  2162 ACTATICCAGGITCIGATAACAAATACTACAAACTAAGIGCAGAIGTACAGGGITICIAC 2221
                                                                                                                                                                                                                           2222 CCATTAGACAGAGATCACCTCTGGGTTGTATCTGCAAAAGCATCTGCAGGATATGCAAAT 2281
                                                                                                                                                                                                                                                                                                               451 GlyThrPheLeuSerSerThrAlaLeuIleArgThrSerAlaArgAlaGlyTyrPhePhe 470
                                                                                                                                                                               471 ThrProGluAsnLysLysLeuGlyThrPheIleIleArgGlyGlnAlaGlyTyrThrVal 490
                                                                                                                                                                                                                                                                     491 AlaArgAspAsnAlaAspValProSerGlyLeuMetPheArgSerGlyGlyAlaSerSer 510
431 AsnAsnValLeuHisProGluAsnGlyHisTyrLeuAspGlyLysIleGlyThrThrLeu 450
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             532 ArgAlaLeuLeuValGlySerLeuGluTyrGlnLeuPro----------
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   545 PheThrArgThrLeuSerGlyAlaValPheHisAspMet-------
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Sequence 55, Application US/09135166
Patent No. 6083743
GENERAL INFORMATION:
APPLICANT: THOMAS, Wayne
APPLICANT: THOMAS, Wayne
APPLICANT: YANG, Yan Ping
APPLICANT: SIA, Dwo Yuan Charles
APPLICANT: SIA, Dwo Yuan Charles
APPLICANT: KIEIN, Michel
TITLE OF INVENTION: HABMOPHILUS OUTER MEMBRANE PROTEIN
NUMBER OF SEQUENCES: 55
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             MEDIUM TYPE: Floppy disk
COMPUTER: IBM PC COMPATIBLE
OPERATING SYSTEM: PC-DOS/AS-DOS
SOFTWARE: Patentin Release #1.0, Version #1.25
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        E: Sim & McBurney
6TH Floor, 330 University Avenue
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                CORRESPONDENCE ADDRESS:
ADDRESSEE: Sim & MCE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       STATE: Ontario
COUNTRY: Canada
ZIP: MSG 1R7
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CITY: Toronto
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AAATTATGGGGAAATAAATTTGAAGGTGCGCAATTCGAGAAAGATTTGCAGTCAATTCGT 1057
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   1178 CTTCGTAGTGCACGCATTATAGGTAATCTGGGAGGTATGTCTGCCGAGCTTGAACCTTTA 1237
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   -----GATATTGCAGATGTAGAAAATGCAATTAAAGCAAAACTTGGA--- 1318
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |||| GATTTTGATGCAAATAAAACATTAGCGATAACCCTTGTTGTTGATGCTGGACGACGACT 1417
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  GluValLeuAspLysGluGlnThrGlyPheLeuAlaGluGluAlaProAspAsnValLys 100
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               101 ThrMetLeuArgSerLysGlyTyrPheSerSerLysValSerLeuThr------ 116
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     146 LeuSerAspGlyAsnLeuAlaGluTyrTyrArgAsnAlaLeuGluAsnTrpGlnGlnPro 165
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         186 ValThrArgLysGlyTyrProLeuAlaLysLeuGlyAsnThrArgAlaAlaValAsnPro 205
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 GAATCTGTTAGTAGCAGTACATTACAAGAACAAATGGAATTACAACCTGATTCTTGGTGG 997
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Mismatches:
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Matches:
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CURRENT APPLICATION DATA:
                                                                                                                   08/433,522
                                                                                                                                                                    ATTORNEY AGENT INFORMATION:
NAME: STEWART, Michael I
REGISTRATION UNBER: 24,971
REFRENCE/DOCKET UNBER: 1038-
TELECOMMUNICATION INFORMATION:
TELEFAX: (416) 595-1155
TELEFAX: (416) 595-1163
INFORMATION FOR SEQ ID NO: 55:
SEQUENCE CHARACTERISTICS:
LENGTH: 2987 base pairs
TYPE: nucleic acid
                                                                                           PRIOR APPLICATION DATA:
APPLICATION NUMBER: 08/4:
FILING DATE: 12-SEP-1995
CLASSIFICATION:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            209.50
35.85%
20.00%
6.60%
                                      APPLICATION NUMBER: FILING DATE:
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Best Local Similarity:
                                                                             CLASSIFICATION:
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US-09-135-166-55
                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Alignment Scores:
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Oy 545 PheThrArdThrLeuSerGlyAlaValPheHisAspMet557
Db 2453 AATGCAATCGCTACAGCTAGCGCAGAGTTAATTGTGGCCAACTCCATTTGTGAGCGATAAG 2512
Oy 532 ArgAlaLeuLeuValGlySerLeuGluTyrGlnLeuPro 544
Db 2393 TATGGTAATGGTACTGGTACTTTTAAGAAGATAAGTTCTGATGTGATTGGTGGT 2452
Qy 526GlySerValLeuProGlu 531
Db 2342 TTACGTGGTTTTGCTTATGGTAGTATTGGACCTAACGCAATTTATGCCGAA 2392
Oy 511 ValArgGlyTyrGluLeuAspSerIleGlyLeuAlaGlyProAsn 525
Db 2282 GGTTTTGGAAACAACGTTTACCGTTCTATCAAACTTATACAGCGGGGGGATCGGTTCA 2341
491
AGCATCT
Qy 471 ThrProGluAsnLysLysLeuGlyThrPhelleIleArgGlyGlnAlaGlyTyrThrVal 490
2162
Db 2108 AATAGAGGCTATTTCCCAACTAAAGGGGTTAAAGCAAGTCTTGGTGGAGGTT 2161
Db 2072 TTTGATTTTTCTTTGGTTGGAACTATAACAGCCTT 2107
Oy 411 IleaspLeuGlyAsnSerHisAlaThrMetLeuThrAlaSerTrpLysArgGlnLeuLeu 430
Db 2012 AACCGTAATTTATATATTCAATCAATGAAATTTAAAGGTAATGGCATTAAAACAAATGAC 2071
403GlyArgLysIleProGly
Db 1952 TCCTATTATGTAGGATTAGGTCATACCTATAATAAAATTAGTAACTTTGCTCTAGAATAT 2011
390 GlyIleAspAlaArgLe
Db 1892 TATAAGGGTACGACTTACGGAAGTAATGTTACGTTTCCCTGTAAATGAAATAAC 1951
2y 373 LeuGluLysArgAlaPheSerGlyGlyIleTrpTyrValArgAspArgAla 389
Db 1832 CTIGGIGGAAAIGTTTCTTTGAAAACTACGATAACTCTAAAAGIGATACATCCTCTAAC 1891
354
::::: Db 1772 TATGGTACGAGTGTCAATTTGGGGTTATACGGGCCCTATTTTACTAAAGATGGTGTAAGT 1831
0y 340 TyrGluThrThrLeuAlaAlaGlyIleSerGlnProArgAsn 353
320 AspfyrTyrAsnLeuPheAsnLysGlyTyrIleGlySerValValTrpAspMetAspLys
300 LysLeuGluThrGlyIleArgLeuAspSerGluTyrGlyLeuGlyGlyLysIleAlaTyr 319 ::: ::: :::
27 201 ENGLINGS ASPRIGATIONALLYS WAISE VALUE TO THE TABLE SEATON
1538 ATTUGUTTAGATUGTAGAGTTTUTTUGAAACAGTUGAAAACUGAATTGATUGT
262 GlnAlaLeuGluGlnAsnGlyHisTyrSerGlyAlaSerValGlnAlaAspPheAspArg
e4
242 GlyLeualaargPheGlnProGlyThrProTyrAspLeuAspLeuLeuLeuAspPheGln

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AlaAsnPheLysArgMet------567
                                             LeuGlyValArgTrpPheSerProLeuAla 584 :::||| :::||| ||||||:::
                                                                        TER MEMBRANE PROTEIN
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                                                                                                                                                                                                                                                                                                   Version #1.25
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Matches:
Conservative:
Mismatches:
Indels:
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                                                                                                                  2779
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4 Gaps: 6 LyaspMetValGluGluHisLeuProLeuI] 7 ELyaspMetValGluGluHisLeuProLeuII 7 IIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIII	24		aProAspAsnValLys			alleLeuGlyAspile				AspSerGlyArgPro ::: TGATGCTGGACGAT								
### ### ### ### ### ### ### ### ### ##	Gaps: 346-55 (1-2987)	JGluHisLeuProLeuIl: 	/PheLeuAlaGluGluAl 	<pre>sSerSerLysValSerLe :::::::::::::: chaagcachaarthachaa</pre>	rThrValHisIleThrPr ::: AGCATTGATGTAAATGA	ValGlyvalAl ::: CTGGGAGGTATGTCTGC	rTyrArgAsnAlaLeuGl ::: rTTCCGCCGTAGT	rTrpGluAsnSerLysTh ::: GTAGAAATGCAATTAA	aLysLeuGlyAsnThrAr ::: ::: AACGGTAAATTCAGTA	AspLeuAsnValValVa 	rGlyThrGlnArgTyrPr 4GGAAATACCGTTTCTGC	rProTyrAspLeuAspLe 	rSerGlyAlaServalGl ::: :: :GAAACAGTCGA	ovalLysvalServalTh GTCGTATATAAAGTCAA	pSerGluTyrGlyLeuGl ::: TACAGAGAGTGGTATTAG	rTyrlleGlyServalva 	SSerGlnProArg :::::: FACCGAGCCTATITIAC	
	4 09) x US-08-942-0	leLysAspMetValGlu ::::: 3TAGCAGTACATTACAA	spLysGluGlnThrGly ::: SAAATAAATTTGAAGGT	rgSerLysGlyTyrPhe ::: RAATAATGGCTATGCC	/saspglyalaTyr 	Ilealaasn acgcattataggtaat	lyAsnLeuAlaGluTyr ::: ::: raCATTTAAATGATACT	spPheAspGlnAspSer GATATTGCAGAT	/sGlyTyrProLeuAla :: scggttAccgtAccccA	ThralaThrVal ::: ATGCAAATAAACATTA	lyaspPheGluIleThr GCCAACTTCGCTTTGAA	rgPheGlnProGlyThr 	luGlnAsnGlyHisTyr ::::: ::: ATCGTACAGGTTTCTTC	AspArgValPro 3TAATGATGAAGTGGAT	hrGlylleArgLeuAsp TGGTATTGGTTACGGT	snLeuPheAsnLysGly - hTTCTTGGGAACAGGG	hrLeuAlaAlaGlyIle ::::: GrGrCAATTTGGGTTAT	i i

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2513 AGCCAAAATACGGTCCGAACCTCCTTATTTGTTGATGCGGCAAGTGTTTGGAATACTAAA 2572
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2342 TTACGTGGTTTTGCTTATGGTAGTAGTT------GGACCTAACGCAATTTATGCCGAA 2392
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1892 TATAAGGGTACGACTTACGAAGTAATGTTAAGGTTTCCCTGTAAATGAAATAAC 1951
                                                                                                 1952 TCCTATTATGTAGGATTAGGTCATACCTATAATAAAATTAGTAACTTTGCTCTAGAATAT 2011
                                                                                                                                                                               2012 AACCGTAATTTATATTCAATCAATGAAATTTAAAGGTAATGGCATTAAAACAAATGAC 2071
                                                                                                                                                                                                                                                               2072 TITGAT ----------------------TITICTITIGGTTGGAACTATAACAGCCTT 2107
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                                                                                                                                                                                                                     411 IleAspLeuGlyAsnSerHisAlaThrMetLeuThrAlaSerTrpLysArgGlnLeuLeu 430
                                                                                                                                                                                                                                                                                                     431 AsnAsnValLeuHisProGluAsnGlyHisTyrLeuAspGlyLysIleGlyThrThrLeu 450
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                                                                                                                                         -----GlyArgLysIleProGlySerAsp 410
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                                                           390 GlyIleAspAlaArgLeuGly------402
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APPLICANT: Anderson, Shawn
APPLICANT: Falco, Carl
APPLICANT: Rafalski, Antoni
TITLE OF INVENTION: Genes Encoding Sulfate Assimilation Proteins
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   2750 CAGTTCCAATTTAGTATTGGAGGTTCTTTC 2779
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; Sequence 5, Application US/09346408B
; Patent No. 6338966
; GENERAL INFORMATION:
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 227 PheGluIleThrGlyThrGlnArgTyrPro-----GluGlnIleValSerGlyLeuAla 244
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                162 TrpGlnGlnProVal-------GlySerAspPheAspGlnAspSerTrpGlu 176
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          TGGGCCACACCCCTGAAAGGCTTCATGAGAGGAGCCGAGTTCCTCCAAACGCTTCATTTC 493
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              494 AACTCGCTCCGACGTCGATGGTCGGTCGTGAACATGTCAGTGCCCATCGTGCTGGCT 553
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62
184
146
25
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Matches:
Conservative:
Mismatches:
Indels:
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FILE REFERENCE: BB-1167-A
CURRENT APPLICATION NUMBER: US/09/346,408B
CURRENT FILING DATE: 1999-07-01
EARLIER APPLICATION NUMBER: 60/092,833
EARLIER FILING DATE: July 14, 1998
NUMBER OF SEQ ID NOS: 12
SOFTWARE: Microsoft Office 97
SEQ ID NO 5
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      245 ArgPheGlnProGlyThrProTyr-----
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134.50
34.46%
22.11%
4.24%
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; ORGANISM: Glycine max
US-09-346-408-5
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Best Local Similarity:
Query Match:
DB:
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1459 GAAGGTGCTGGTTGATTACTAT-----GATAGCTTAGTACTCTCAAGG---AACGGCAA 1509
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                                                                                                                                                                                                                                                   ----TACACCAAAGCTGATGTCCCA 1018
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   393 AlaArgLeuGlyAlaGluPheLeuAlaGluGlyArgLysIleProGlySerAsp-IleAs 412
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                                                                                                                                                                                                                                                                                                                  333 ValValTrpAspMetAspLysTyrGluThrThrLeuAlaAlaGlyIleSerGlnProArg 352
                                                                                                                                                                                                                                                                                                                                                                                                                                               353 AsnTyrArgGlyAsnTyrTrpThrSerAsnValSerTyrAsnArgSerThrThrGlnAsn 372
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                                                                                                                                                                                     LeuGlyGlyLysIleAlaTyrAspTyrTyrAsnLeuPheAsnLysGlyTyrIleGlySer 332
                                                              GluValLysArgHisLysLeuGluThrGlyIleArg-----LeuAspSerGluTyrGly 312
                                                                                                                         926 GACACCCGAAAGCGCCTTCTTGAGATGGGCTATAAGAATCCTGTCCTCTTGCTTCATCCA 985
866 GCTGTGTTTGCCTTCCAGCTCCGGAATCCTGTTCACAATGGCCATGCTTTGCTAATGACT 925
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; Sequence 3, Application US/09346408B
; Sequence 3, Application US/09346408B
; Patent No. 6338966
; GENERAL INFORMATION:
; APPLICAMT: Anderson, Shawn
; APPLICAMT: Rafalsk', Antoni
; TITLE OF INVENTION: Genes Encoding Sulfate Assimilation Proteins
; FILE REFERENCE: BB-1167-A
; CURRENT APPLICATION NUMBER: US/09/346,408B
; CHRENT FILING DATE: 1999-07-01
; EARLIER PILING DATE: July 14, 1998
; NUMBER OF SEQ 1D NOS: 12
; SOFTWARE: Microsoft Office 97
; SEQ 1D NO 3
; LENGTH: 2280
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ογ	130	ProArgThrLysIleAlaAsnValGlyValAlaIleLeuGlyAspIleLeuSerAspGly	149
g	232 (CCGCGGGTGCGCCCGCGCGTG	261
οy	150 /	AsnLeualaGluTyrTyrArgAsnAlaLeuGluAsnTrpGlnGlnProValGlySer	168
qq	262	GAGTGGCGCACGTGCTCGCCGAGGCTTGGGCGTCCCCGCTTGC	312
ογ			184
đ	313 4	ATGCGGGAGCACGAGTACCTCCAGTGCCTCCACTTCAACTCCCTCC	372
ò		AlaValThrArgLysGlyTyrProLeuAlaLysLeuGlyAsnThrArg	200
qq	373 (GGCCTCGCCAACATGTCGCTCCCCATCGTGCTCGCCGACGACGCCGCCAAGGACCGC	432
δý	201	AlaAlaValAsnProAspThrAlaThrValAspLeuAsnValValValAspSerGlyArg	220
Dp	433 (GTCGGCGCCCCCCGACGTCGCG	456
οy	221	ProllealaPheGlyAspPheGluIleThrGlyThrGlnArgTyrPro	236
qq	457	CTCGCCGGGCCCGACGCGAGCTCCTCGCCGTCCTCCGCAGTGTCGAAATATACCCT	513
δγ	237	GluGlnIleValSerGlyLeuAlaArgPheGlnProGlyThrProTyr	252
QQ	514 (CACAATAAAGAAGAAAGGATTGCAAGAACATGGGGGACAACTGCGCCTGGCTTACCTTAT	573
ογ	253	nagara	257
QQ	574 (GTCGATGAGGCGATAACACCAGCTGGAAACTGGCTGATTGGTGGTGGTGATCTGGAGGTGTTG	633
Ογ	258 1	LeuAspPheGlnGlnAlaLeuGluGlnAsnGlyHisTyrSerGly	272
QQ	634	CAACCCATTAAGTATAACCCTTGACCATTACAGGCTTTCACCC	681
Οy	273 1	AlaSerValGlnAlaAspPheAspArgLeuGlnGlyAspArgVal	287
q	682 (CAGCAACTTAGGGACGAATTCGACAAGCGTGGGGCTGATGCTGTTTGCATTCCAGTTG	741
ογ	288	ProvalLysValSerValThrGluValLysArgHisLysLeu	301
Dp	742 1	AGAAACCCAGTCCACAATGGGCATGCACTGTTGATGAATGA	801
φ	302 (GluThrGlyIleArgLeuAspSerGluTyrGlyLeuGlyGlyLysIleAlaTyr	319
Dp	802 (JCC	849
ò	320	AspTyrTyrAsnLeuPheAsnLysGlyTyrIleGlySerValValTrpAspMetAspLys	339
QQ	850	TTTACAAAAGCTGATGTCCCCGCTGCTTAGAATGGAACAA	894
δ	340		359
Q	895 (CACAGCAAGGTCTTAGAAGATGGAGTCCTTGACCCCGAGACCACTATGGTGTTTTT	954
ογ	360		379
QQ	955 (CCCTCCCCAATGCATTATGCTGGTCCAGCAGAAGTGCAG	693
οy	380 (GlyGlyIleTrpTyrValArgAspArgAlaGlyIleAspAlaArgLeuGlyAlaGluPhe	399
g	984	TGGCATGCAAAGGCACGAATTAACGCCGGTGCTATTTC	1032
οy	400	LeuAlaGluGlyArgLysIleProGlySerAspIl	419
qq	1033	TACATAGTGGGTCGTGATCCAGCTGGGATGGGCCATCCGACA	1074
οy	420 1	MetLeuThrAlaSerTrpLysArgGlnLeuLeuAsnAsnValLeuHisProGluAsnGly	439
ор	1075 (1107

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1624 GCGCACCAGATCCACGCCCTTGATGAGCATCTTACCCCCGTAGATGACGCCGATGTACTT 1565
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                              1108 AAGAAGGTCCTAAGCATGGCCCCCGGTTTGGAGAAACTCAACATATTGCCCTTCAAGGTA 1167
                                                                                 1285 CCTGATGGTTTCATGTGCCCTGGTGGTGGAAGGTTCTTGTTGACTACTACAATAGCTTG 1344
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                                                              458 AlaLeulleArgThrSerAlaArgAlaGlyTyrPhePheThrProGluAsnLysLysLeu 477
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440 ---HisTyrLeuAspGlyLysIleGly---ThrThrLeuGlyThrPheLeuSerSerThr 457
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CURRENT APPLICATION DATA:
APPLICATION NUMBER: US/07/482,634
FILLING DATE: 21-FEB-1990
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1762 GAGAGTATACTAAAAAAGGTACC------1809
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              ; TOPOLOGY: linear
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US-08-038-682-5
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2635 AGTTIAAGAITTAAAACTTCAGGCICAAAAAACTGGCITCICAAT-AGAGAAAGATT 2693
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2170 AAATACGCTATCACAAATATATGAAGGGACTTTAAATATTTCAGGGAAAGTGAACATC 2229
                                                            2230 TCAATGGTTTTACCTAAAAATGAAAGTGGATATGATAAATTCAAAGGACGCACTTACTGG 2289
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2548 GATTC-----ACACTCTCGCCTCATCC-----
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1588 AATGCA-----ATTGTTGACGCCAAAGAGTGGTTGTTGAC----- 1623
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           1529 ATATCGCTAAAACCGGTGGTTTT-GTGGAGACGTCGGGGCATGATTTATTCATCAAAGAC 1587
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 GlnThrGlyPheLeuAlaGluGluAlaProAspAsnValLySThrMetLeuArgSerLys 106
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         107 GlyTyrPheSerSerLysValSerLeuThrGluLysAspGlyAlaTyrThr----- 123
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             47 ValLysLeuLysProLysPheProValArgIleAspThrGlnAspSerGluIleLysAsp
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        MetValGluGluHisLeuProLeuIleThrGlnGlnGlnGluGluValLeuAspLysGlu
                                                                                             APPLICANT: Barenkamp, Stephen J
TITLE OF INVENTION: High Molecular Weight Surface Proteins
TITLE OF INVENTION: of No. 5603938-Typeable Haemophilus
                                                                                                                                                                                     ADDRESSEE: Shoemaker and Mattare, Ltd.
STREET: Shoemaker and Mattare, Ltd.
STREET: Bldg. 1
CITY: Arlington
STATE: Virginia
COUNTRY: Us.A.
22202-0286
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138
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Conservative:
Mismatches:
Indels:
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       APPLICATION NUMBER: US/08/302,832
FILING DATE: 16-SEP-1994
FILING DATE: 16-SEP-1994
FILING APPLICATION DATA:
APPLICATION NUMBER: GB 9205704.1
FILING DATE: 16-MAR-1992
PRIOR APPLICATION NUMBER: GB 9205704.1
FILING DATE: 16-MAR-1993
APPLICATION NUMBER: US pct/us93/02166
FILING DATE: 16-MAR-1993
ATTORNEY AGENT INFORMATION:
NAME: Berkstresser, Jerry W
RECISTRATION NUMBER: 1038-404
TELEPHONE: (703) 415-0810
TELEPHONE: (703) 415-0810
TELEPHONE: (703) 415-0813
INFORMATION FOR EXC. DENO: 5:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Length:
                                                                                                                                                                                                                                                                                                                                                                                           MEDIUM TYPE: Floppy disk
COMPUTER: IBM PC compatible
OPERATING SYSTEM: PC-DOS/MS-DOS
US-08-302-832-5; Sequence 5, Application US/08302832; Patent No. 5603938; GENERAL INFORMATION:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        MOLECULE TYPE: DNA (genomic)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          SEQUENCE CHARACTERISTICS:
LENGTH: 9171 base pairs
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      114.00
32.82%
21.36%
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                                                                                                                                                                NUMBER OF SEQUENCES: 8
CORRESPONDENCE ADDRESS:
                                                                                                                                                                                                                                                                                                                                                                        COMPUTER READABLE FORM:
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Best Local Similarity:
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Alignment Scores:
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qq	1657	GGACGCAGCAATACTTCAGAAGACGATGAATACACGGGATCCGGG	1701	
ογ	124	ValHisileThrProGlyProArgThrLysileAlaAsnValGlyValAlalleLeu	142	
q	1702	A	1761	
ογ	143	GlyAspileLeuSerAspGlyAsnLeuAlaGluTyrTyrArgAsnAlaLeuGluAsnTrp	162	
QQ	1762		1809	
ò é	163	GInGInProvalGlySeraspheaspGlnAspSerTrpGluAsn :: 11 1 1 1 1 1 1 1 1	177	
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, g	1891		1938	
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op Op	1939	::: :::	1998	
ογ	225		239	
qq	1999	::: GGTAACATAAACAGTAACAGCTAAACAAGATATCGCCTTTGAGAAAGGAAGCAAGGTC	2058	
δy	240	ValSerGlyLeuAlaArgPheGlnProGlyThrProTyrAspLeuAspLeuLeuLeuAsp	259	
g	2059	ATTACAGGTCAAGGGACTATTACCTCA	2091	
ογ	260	PheClnGlnAlaLeuGluGlnAsnGlyHisTyrSerGlyAlaSerValGlnAlaAspPhe	279	
QQ	2092	:::::	2136	
ò	280	AspArgLeuGlnGlyAspArgValProValLysValS	299	
qq	2137		2169	
δ	300	LysLeuGluThrGlylleArgLeuAspSerGluTyrG	317	
q	2170		2229	
οy	318	TyrTyr	322	
g G	2230	TCAATGGTTTTACCTAAAAATGAAAGTGGATATGATATAAATTCAAAGGACG	2289	
ογ	323		340	
a	2290		2349	
ò	341		360	
g	2350	GGAAGCGATAGTGCAGGCACACTTACCCAGCCTTATAAATTTAAACGGT	2397	
ογ	361	Ser	380	
qq	2398		2442	
ò	381	GlyileTrpTy	396	
οp	2443		2487	
δy	397		411	
음	2488		2547	
οχ	412	AspLeuGlyAsnSerHisalaThrMetLeuThrAlaSerTrpLysArgGlnLeuLeuAsn ::: :::	431	
QQ	2548		2574	

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2865 CAACGCTAACGTC-----ACTCTTATCGGTTCGGATTTTGACAACCATCA 2909
                                                                                                                        2635 AGTITAAGATITAAAACTICAGGCICAACAAAACIGGCITCICAAT-AGAGAAAGAITT 2693
                                                                                                                                                                                                      2694 AACTITAAATGCCACCGGAGGCAACATAACACTITTGCAAGTTGAAGGCACCGATGGAAT 2753
                                                                                                                                                                                                                                                                       2575 AACGTCCAAACCCCCGGTGTAGTTATAATTCTAAATACTTTAATGTTTCAACAGGGTCA 2634
                                                                                                                                                                                                                                                                                                                                                                  2811 GTTTGCCTCCAGGAAAGCCGTAACA-----GAAATCGAAGGCAATGTTACTATCAATAA 2864
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                                                                                                                                                                469 PhePheThrProGluAsnLysLysLeuGlyThrPheIle-IleArgGlyGlnAlaGlyTy 488
AsnValLeuHisProGlu-----AsnGlyHisTyrLeuAspGlyLysIleGlyThr 448
                                                                                449 ThrLeuGlyThrPheLeuSerSerThrAlaLeuIleArgThrSerAlaArgAlaGlyTyr 468
                                                                                                                                                                                                                                              r-----ThrValAlaArgAspAsnAlaAspValProSerGlyLeuMetPheAr 504
                                                                                                                                                                                                                                                                                                                              gSerGlyGlyAlaSerSerValArgGlyTyrGluLeuAspSerIleGlyLeuAlaGlyPr 524
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          nLeuProPheThr------ArgThrLeuSerGl 551
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         yAlaValPheHisAspMetGly------AspAlaAlaAlaAsnPheLysArgMe 567
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         567 tLysLeuLysHisGlySerGlyLeuGlyValArgTrpPheSerProLeuAlaProPheSe 587
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            CAATATTGTCAATATAGCCGGAAATCTTACCGTTGAAAGTAACGCTAATTTCAAA----
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Patent No. 5869065

GENERAL INFORMATION:
TELLE APPLICANT: ST. GEME III, JOSEPH W

APPLICANT: ST. GEME III, JOSEPH W

TITLE OF INVENTION: HIGH MOLECULAR WEICHT SURFACE PROTEINS
TITLE OF INVENTION: OF NON-TYPEABLE HAEMOPHILUS
NUMBER OF SEQUENCES: 8

CORRESSES: Shoemaker and Mattare, Ltd
STREET: Bldg. 1

CITY: Arlington

STREET: Wirginia

COUNTRY: U.S.A.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Patentin Release #1.0, Version #1.25
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APPLICATION NUMBER: US/08/530,198
FILING DATE: 13-DEC-1995
CLASSIFICATION: 424
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          IBM PC compatible
YSTEM: PC-DOS/MS-DOS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             COMPUTER READABLE FORM:
MEDIUM TYPE: Floppy disk
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     ATTORNEY/AGENT INFORMATION
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US-08-530-198-5
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NAME: BERKSTRESSER, JERRY W REGISTRATION NUMBER: 22,651 REFRENCE/DOCKET NUMBER: JWB-1186 TELECOMMUNICATION INFORMATION: TELEPHONE: (703) 415-0813 INFORMATION FOR SEQ ID NO: 5: SEQUENCE CHARACTERISTICS: LENGTH: 9171 base pairs TYPE: nucleic acid STRANDEDNESS: single TOPOLLOGY: linear MOLECULE TYPE: DNA (genomic)	ment Scores: 0.23 Length: 9171 No.: 114.00 Matches: 138 int Similarity: 32.82% Conservative: 74 Local Similarity: 21.36% Mismatches: 235 Local Similarity: 3.59% Indels: 201 * Match: 2 Gaps: 33	-857-669-2 (1-609) x US-08-530-198-5 (1-9171)	47 VallysLeuLysProLysPheProValArgIleAspThrGlnAspSerGluIleLysAsp 66 ::: 1529 ATATCGCTAAAACCGGTGGTTTT-GTGGAGGCGCGCGCGTGATTATTCATCAAAGAC 1587	eullerhrGlnGlnGlnGluGluValLeuAspLysGlu 86	506 AMIGCA		107 GlyTyrPheSerSerLysValSerLeuThrGluLysAspGlyAlaTyrThr 123 	124ValHisileThrProGlyProArgThrLysileAlaAsnValGlyValAlaileLeu 142 	143 GlyAspileLeuSerAspGlyAsnLeuAlaGluTyrTyrArgAsnAlaLeuGluAsnTrp	1762 GAGAGTATACTAAAAAAAGGTACCTTTGTTAACATCATCACTGCTAATCAA 1809 163 GInGInProValGIySerAspPheAspGlnAspSerTTGTLAACATCATGLUASn 177	 GCAGCTTAACTCTTTGGAGTGAG	178 SerLysThrSerValLeuGlyAlaValThrArgLysGlyTyrProLeuAlaLysLeuGly 197 :::::	198	1891GAGATTAACAACGATATTACCACGGTGATGATACCAGAGGTGCAAAC 1938	214 ValValvalaspSerGlyArgProlle	225 GlyAspPheGluileThrGlyThrGln	ValSerGlyLeuAlaArgPheGlnProGlyThrProTyrAspLeuAspLeuLeuLeuAsp 259
N TELL TELL TELL TELL TELL TELL TELL TEL	Alignment Pred. No. Score: Percent S Best Loca Query Mat DB:	0S-09-85	2	Oy 6	1	-	Qy 10 Db 165	Oy 12	'	ob 176 Oy 16	-	Oy 17 Db 187		Db 189	Oy 21 Db 193	Oy 22	

CTTAC	300 LysLeuGluThrG1- 2170 AAATAGGCTATCAC. 318	ASPARGLEUGINGlyAspArgValProValLysValSerValThrGluValLysArgHis 299 AGCGGACCATCAAAAAAAACAATAAAAAAAAAAAAAAAA
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                                                               3042 TTTTAATGTAGGC----GGCTTGTTTGACAACAAGGCAATTCAAATATTTCCATTGCCAA 3098
                                         rPheAspIleAlaTyrGlyHisSerAspLysLysIleArgTrpHisIleSerLeu----
                                                                                                                                                                                Sequence 5, Application US/08469880
Patent No. 5876733
GENERAL INFORMATION:
APPLICANT: Barenkamp, Stephen J.
TITLE OF INVENTION: High Molecular Weight Surface Proteins
TITLE OF INVENTION: of No. 5876733-Typeable Haemophilus
NUMBER OF SEQUENCES:
CORRESPONDENCE ADDRESS:
ADDRESSEE: Shoemaker and Mattare, Ltd.
                                                                                                                                                                                                                                                                                                               ADDRESSEE: Shoemaker and Mattare, Ltd.
STREET: 2001 Jefferson Davis Hwy., 1203 Crystal Plaza
STREET: Bldg. 1
STREET: Strington
STATE: Virginia
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Matches:
Conservative:
Mismatches:
Indels:
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       PRILING DATE: 16-MAR-1992
PRIOR APPLICATION UNBER: 36-MAR-1992
PRIOR APPLICATION DATA:
APPLICATION NUMBER: US PCT/US93/02166
FILING DATE: 16-MAR-1993
PRIOR APPLICATION DATA:
APPLICATION NUMBER: US 08/302,832
FILING DATE: 16-SEP-1994
ATTORNEY/AGENT INFORMATION:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                SOFTWARE: Patentin Release #1.0, CURRENT APPLICATION DATA: APPLICATION NUMBER: US/08/469,880 FILING DATE: 06-JUN-1995
                                                                                                                                                                                                                                                                                                                                                                                                                      COMPUTER READABLE FORM:
MEDIUM TYPE: Floppy disk
CMPUTER: IBM PC compatible
OPERATING SYSTEM: PC-DOS/MS-DOS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      TELECOMMUNICATION INFORMATION:
TELEPHONE: (703) 415-0810
TELEFAX: (703) 415-0813
INFORMATION FOR SEQ ID NO: 5:
SEQUENCE CHARACTERISTICS:
LENGTH: 9171 base pairs
TYPE: nucleic acid
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               NAME: Berkstresser, Jerry W
REGISTRATION NUMBER: 22,651
REFERENCE/DOCKET NUMBER: 103
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114.00
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PRIOR APPLICATION DATA:
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ZIP: 22202-0286
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ValLysLeuLysProLysPheProValArglleAspThrGlnAspSerGluIleLysAsp 66

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------CCGGATAATGTATCTATTAATGCAGAAACAGCA 1656
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               ------GAGATTAACAACGATATTACCACGGTGATGATACCAGAGGTGCAAAC 1938
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       1939 TTAACAATTTACTCAGGGGGGTGGGTTGATGTTCATAAAAATATCTCACTCGGGGGGGCAA 1998
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     ||||::: ||||||| GGTAAAGATAACAGGTATGGCCTTTGAGAAAGGAAGCAACCAAGTC 2058
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    ------CAAAAAGGTTTTAGATTTAATAATGTCTCTCTAAACGGCACTGGC 2136
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            2137 AGCGGACTGCAA--------------TTCACCACTAAAAGAACCAAT 2169
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             2170 AAATACGCTATCACAAATAAATTTGAAGGGACTTTAAAATATTTCAGGGAAAGTGAACATC 2229
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                                                                                                                                                                                                                                                                                                                                                                                   GGACGC------AGCAATACTTCAGAAGACGATGAATACACGGGATCCGGG 1701
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                                                                                                                                                                                                      GlnThrGlyPheLeuAlaGluGluAlaProAspAsnValLysThrMetLeuArgSerLys 106
                                                                                                                                                                                                                                                                                                                                                                                                                                                  ---ValHisIleThrProGlyProArgThrLysIleAlaAsnValGlyValAlaIleLeu 142
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                                                                                                                    MetValGluGluHisLeuProLeuIleThrGlnGlnGluGluGluValLeuAspLysGlu
                                                                                                                                                                                                                                                                                                                          107 GlyTyrPheSerSerLysValSerLeuThrGluLysAspGlyAlaTyrThr-----
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                                                                                                                                                              AspLeuGlyAsnSerHisAlaThrMetLeuThrAlaSerTrpLysArgGlnLeuLeuAsn 431
-----ATATCATTCAACAAGACACTACCTTTAATGTTGAACGAAATGCA-----
                                                                                               ....------AlaGluPheLeuAlaGluGlyArgLySIleProGlySerAspIle
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Patent No. 5928651

GENERAL INFORMATION:

TITLE OF INVENTION: High Molecular Weight Surface Proteins
TITLE OF INVENTION: of No. 5928651-Typeable Haemophilus
NUMBER OF SEQUENCES:

CORRESPONDENCE ADDRESS:

ADDRESSEE: Shoemaker and Mattare, Ltd.

STREET: 2001 Jefferson Davis Hwy., 1203 Crystal Plaza
STREET: ALlington

CITY: Allington
STATE: Virginia
                                GlyIleTrpTyrValArgAspArgAlaGlyIleAspAlaArgLeuGly---
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1810 CGCATCTATGTCAATAGCTCCATTAATTTATCCAATGGCAGCTTAACTCTTTGGAGTGAG 1869
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     163 GlnGlnProValGlySerAspPheAspGlnAspSer-----TrpGluAsn 177
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138
74
235
201
33
                                                                                 SYSTEM: PC-DOS/MS-DOS
PatentIn Release #1.0, Version #1.30
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Mismatches:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            US-09-857-669-2 (1-609) x US-08-728-470-5 (1-9171)
                                                                                                                                                                                           CLASSIFICATION: 424
PRIOR APPLICATION DATA:
APPLICATION NUMBER: US 08/302,832
FILING DATE: 16-MAR-1993
PRIOR APPLICATION NUMBER: US PCT/US93/02166
FILING DATE: 16-MAR-1993
PRIOR APPLICATION DATA:
APPLICATION NUMBER: US PCT/US93/02166
FILING DATE: 16-MAR-1993
ATTORNEY/AGENT INFORMATION:
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                                                                                                           SOFTWARE: Patentin Release #1.0, CURRENT APPLICATION DATA:
APPLICATION NUMBER: US/08/728,470
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  1038-633
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           REFERENCE/DOCKET NUMBER: 103
TELECOMMUNICATION INFORMATION:
TELEPAX: (703) 415-0810
TELEFAX: (703) 415-0813
INFORMATION FOR SEQ ID NO: 5:
SEQUENCE CHARACTERISTICS:
LENGTH: 9171 base pairs
                                       MEDIUM TYPE: Floppy disk
COMPUTER: IBM PC compatible
OPERATING SYSTEM: PC-DOS/MS-
                                                                                                                                                                                                                                                                                                                                                                                                                                                NAME: Berkstresser, Jerry W
REGISTRATION NUMBER: 22,651
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       MOLECULE TYPE: DNA (genomic)
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32.82%
21.36%
3.59%
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ZIP: 22202-0286
COMPUTER READABLE FORM:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       TYPE: nucleic acid
STRANDEDNESS: sing
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                                                                                                                                                                               FILING DATE:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Alignment Scores:
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Pred. No.:
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	TTAACAATTTACTCAGGCGCTGGCTTGATGATCATAAAATATCTCACTCGGGCGCAA GlyAspPheGlulleThrClyThrCln	PheGlnGlnAlaLeuGluGlnAsnGlyHisTyrSerGly	LysLeuGluThrGlyIleArgLeuAspSerGluTyr 	AsnLeuPheAsnLysGlyTyrIleGlySerValValTrpAspMetAspLysTyr		ASNVALLEUHISPROGLU-
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2754 GATTGGTAAAGGCATTGTAGCCAAAAAAAAAACATAACCTTTGAAGGAGGTAAGATG---AG 2810
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                                                                                504 gSerGlyGlyAlaSerSerValArgGlyTyrGluLeuAspSerIleGlyLeuAlaGlyPr 524
                                                                                                                                                                                                                                                     542 nLeuProPheThr-----ArgThrLeuSerGl 551
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  ----ThrValAlaArgAspAsnAlaAspValProSerGlyLeuMetPheAr 504
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Sequence 5, Application US/08617697
Sequence 5, Application US/08617697
Fatent No. 5977336
GENERAL INFORMATION:
APPLICANT: Barenkamp, Stephen J
TITLE OF INVENTION: High Molecular Weight Surface Proteins
TITLE OF INVENTION: of No. 5977336-Typeable Haemophilus
NUMBER OF SEQUENCES: 11
CORRESPONDENCE ADDRESS:
ADDRESSPEN: Shoemaker and Mattare, Ltd.
STREET: 2001 Jefferson Davis Hwy., 1203 Crystal Plaza
STREET: Wilnigton
STATE: Virginia
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Patentin Release #1.0, Version #1.30
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CLASSIFICATION: 424
PRIOR APPLICATION DATA:
APPLICATION NUBBER: US 08/302,832
FILING DATE: 05-OCT-1994
PRIOR APPLICATION DATA:
APPLICATION NUBBER: US PCT/US93/02166
FILING DATE: 16-MAR-1993
ATTORNEY AGENT INFORMATION:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                NAME: BEKKITESSET, JEFFY W
REGISTRATION NUMBER: 22,651
REFERENCE/DOCKET NUMBER: 1038-557
TELECOMMUNICATION INFORMATION:
TELEPHONE: (703) 415-0810
INFORMATION FOR SEQ ID NO: 5:
SEQUENCE CHARACTERISTICS:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  OPENAL:
OURNER: Patenal...
CUGRRENT APPLICATION DATA:
APPLICATION NUMBER: US/08/617,697
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ZIP: 22202-0286
COMPUTER READABLE FORM:
MEDLUM TYPE: Floppy disk
COMPUTER: IBM PC compatible
OPERATING SYSTEM: PC-DOS/MS-DOS
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s mic)	Length: Matches: Conservativ Mismatches: Indels:	08-617-697-5 (1-9171)	VallysLeuLysProLysPheProValArgIleAspThrGlnAspSerGluIleLysAsp :::	MetValGluGluHisLeuProLeuIleThrGlnGlnGlnGluGluVa	ATTGTTGACGCCAAAGAGTGGTTGTTAGAC	uGluAl	CCGGGTGGTGTGTGTGTGTGTGTGTGTGTGTGTGTGTGT	svalserLeurnrGlubysAspGlyAlaTyrTnr 	yProArgThrLysIleAlaA	ACGAAACAAAGAAAAGACAA	yAsnLeuAlaGluTyrTyrA 	pPheAspGlnAspSer	::: :CATTAATTTATCCAATGGCA	.yAlaValThrArgLysGlyT 	-GGGGGGTT	AsnThrArgAlaAlaValAsnProAspThrAlaThrValAsp- :::	gProlle	origeeriearerranaa.	.yThrGln :TAAACAAGATATCGCCTTTG	ValSerGlyLeuAlaArgPheGlnProGlyThrProTyrA	TACCTCAGGCAAT	InAsnGlyHisTyrSerGlyA	AAGGTTTTAGATTTAATAATG	rgValProValLysValSerV	L
LENGTH: 9171 base pairs TYPE: nucleic acid STRANDEDNESS: single TOPOLOGY: linear DLECULE TYPE: DNA (genomi	ment Scores: 0.23 No.: 114.00 in Similarity: 32.828 Local Similarity: 21.368 Match: 2.598	-669-2 (1-609) x US-0	VallysLeuLysProLysPh ::: ATATCGCTAAAACCGGTGGT	MetValGluGluHisLeuPr	AATGCA	GlnThrGlyPheLeuAlaGl		G1Y1YrPneserserLysva GACGC	ValHisileThrProGl	AATAGTGCCAGCACCCCAAA	GlyaspileLeuSeraspGlyasn' GAGAGTATACTAAAAAAGGTACC	nGlnProValGly	CGCATCTATGTCAATAGCTC	SerLysThrSerValLeuGl	CCGGT	AsnThrArgAlaAlaValAs ::: GAGATTAA	ValValValAspSerGlyArgProlle:::::::::::::::::::::::::::::::::::	TIMCAMITIACICAGECGE	GlyAspPheGluIleThrGl ::: GGTAACATAAACATTACAGC	ValSerGlyLeuAlaArgPP	ATTACAGGTCAAGGGACTATTACCTCAGGCAAT	PheGlnGlnAlaLeuGluGl	CAAA	AspArgLeuGlnGlyAspAr	U
LENGTH: TYPE: STRANDE TOPOLOC MOLECULE		09-857-	47	67	1588	87		1657	124	1702	143	163	1810	178	1870	198 1891	214	6661	225	240	2059	260	2092	28	2137
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οy	361	erAsnValSerTyrAsnArgSerThrThrGlnAsnLeuGluLysArgAlaPheSerGly 38	0
qq	2398	CA 24	42
οy	381 (ylleTrpTyrValArgAspArgAlaGlylleAspAlaArgLeüGly 39.	9
QQ	2443	TTTGACATCAAGGCACCAATAGGGATAAATAAGTAT 24	187
οy	397		11
QQ	2488	25	147
ΟŽ	412	GlyAsnSerHisAlaThrMetLeuThrAlaSerTrpLysArgGlnLeuLeuAsn 4 :::	31
Вр	2548	2ACACITCTCGCCICAICCTCT 2	574
Qy Dp	432	ASNVALLGUHISPFOGLUASNGLYHISTYFLGUASPGLYLYSILGCLYThr 446 	34
ογ	449	ThrLeuGlyThrPheLeuSerSerThrAlaLeuIleArgThrSerAlaAlaGlyTyr 46	89
QO	2635	-AGAGAAGATTT 26	693
οy	469	PhePheThrProcludsnLysLeuGlyThrPhelle-IleArgGlyGlnAlaGlyTy 48	88
qq	2694	27	753
οy	488	rThrValAlaArgAspAsnAlaAspValProSerGlyLeuMetPheAr 50.	4
qq	2754	28	310
δŏ	504	gSerGlyGlyAlaSerSerValArgGlyTyrGluLeuAspSerIleGlyLeuAlaGlyPr 524	24
qq	2811	-GAAATCGAAGGCAATGTTACTATCAATAA 28	364
Qγ	524	LeuLeuValGlySerLeuGluTyrGl 54	2
qq	2865	ACTCTTATCGGTTCGGATTTTGACAACCATCA 29	909
δy	542	ArgThrLeuSerGl 55	15
qq	2910	TTAAAAAAGATGTCATCATTAATAGGGGCAACCTTACGGCTGGAGG 29	696
ολ	551	SASPMETGlySSPAlaAlaAlaAsnPheLysArgMe 56	22
qq	2970	PAGCCGGAAATCTTACCGTTGAAAGTAACGCTAATTTCAAA 30	224
οy	267	tLysLeuiysHisGlySerGlyLeuGlyValArgTrpPheSerProLeuAlaProPheSe 587	37
qq	3025	GCTATCACAAATTTCAC 304	041
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-CCGGATAATGTATTAATGCAGAAACAGCA 1656
                                                                                                      GGACGC-----AGCAATACTTCAGAAGACGATGAATACACGGGATCCGGG 1701
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                                                                                                                                                                                                                               143 GlyAspileLeuSerAspGlyAsnLeuAlaGluTyrTyrArgAsnAlaLeuGluAsnTrp 162
                                                                                                                                                                                                                                                                                                                -----TrpGluAsn 177
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                                                                                                                                                                                                                                                                                                                                                                                                  178 SerLysThrSerValLeuGlyAlaValThrArgLysGlyTyrProLeuAlaLysLeuGly 197
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                                                            107 GlyTyrPheSerSerLysValSerLeuThrGluLysAspGlyAlaTyrThr-
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                                                                                                                                                                                                                                                                                                             GlnGlnProValGlySerAspPheAspGlnAspSer----
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     1529 ATATCGCTAAAACCGGTGGTTTT-GTGGAGACGTCGGGGCATGATTTATTCATCAAAGAC 1587
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              GlnThrGlyPheLeuAlaGluGluAlaProAspAsnValLysThrMetLeuArgSerLys 106
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                98
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            MetValGluGluHisLeuProLeuIleThrGlnGlnGlnGluGluValLeuAspLysGlu
                                                                                                                                  GENERAL INFORMATION:
APPLICANT: Barenkamp, Stephen J
TITLE OF INVENTION: High Molecular Weight Surface Proteins
TITLE OF INVENTION: of No. 6218141-Typeable Haemophilus
NUMBER OF SEQUENCES: 10
CORRESPONDENCE ADDRESS:
                                                                                                                                                                                                                           ADDRESSEE: Shoemaker and Mattare, Ltd.
STREE: Stoemaker and Mattare, Ltd.
STREET: Bldg. 1
CITY: Arlington
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    SOFTWARE: Patentin Release #1.0, Version #1.30 CURRENT APPLICATION DATA:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Length:
Matches:
Conservative:
Mismatches:
Indels:
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       FILING DATE: 16-MAR-1993
PRIOR APPLICATION DATA:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         REFERENCE/DOCKET NUMBER: 1038-625
TELECOMMUNICATION INFORMATION:
TELEPHONE: (703) 415-0810
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           US 08/302,832
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             APPLICATION NUMBER: US/08/719,64
                                                                                                                                                                                                                                                                                                                                                                                                                                       MEDIUM TYPE: Floppy disk
COMPUTER: IBM PC compatible
OPERATING SYSTEM: PC:DOS/MS-DOS
                                                                                             Sequence 5, Application US/08719641 Patent No. 6218141
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               NAME: Berkstresser, Jerry W
REGISTRATION NUMBER: 22,651
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   PRIOR APPLICATION DATA:
APPLICATION NUMBER: US 08/
FILING DATE: 16-SEP-1994
PRIOR APPLICATION DATA:
APPLICATION NUMBER: US PCT.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               TOPOLOGY: linear
MOLECULE TYPE: DNA (genomic)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      TELEFAX: (703) 415-0813
INFORMATION FOR SEQ ID NO: 5:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                APPLICATION NUMBER: GB 92
FILING DATE: 16-MAR-1992
ATTORNEY/AGENT INFORMATION:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        SEQUENCE CHARACTERISTICS:
LENGTH: 9171 base pairs
TYPE: nucleic acid
3099 AGGAGGGCTCGCTTT 3114
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21.36%
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      CLASSIFICATION: 530
                                                                                                                                                                                                                                                                                                                                 CITY: Arlington
STATE: Virginia
COUNTRY: U.S.A.
ZIP: 22202-0286
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Best Local Similarity:
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                                                                                                                                                                                                                                                                                                                      2754 GATTGGTAAAGGCATTGTAGCCAAAAAAAACATAACCTTTGAAGGAGGTAAGATG---AG 2810
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                                                                                                                                                                                                                                                                                                                                                                                        2811 GTTTGGCTCCAGGAAAGCCGTAACA----GAAATCGAAGGCAATGTTACTATCAATAA 2864
2575 AACGTCCAAACCCCCGGTGTAGTTATAAATTCTAAATACTTTAATGTTTCAACAGGGTCA 2634
                                                                                                                                                                                                                                                                                                                                                                                                                      524 oAsnGlySerValLeuProGluArgAlaLeuLeuValGlySer-----LeuGluTyrGl 542
                                                                                              AsnValLeuHisProGlu-----AsnGlyHisTyrLeuAspGlyLysIleGlyThr 448
                                                                                                                                                                                                                          469 PhePheThrProGluAsnLysLysLeuGlyThrPheIle-IleArgGlyGlnAlaGlyTy 488
                                                                                                                                                                                                                                                                                                                                                        504 gSerGlyGlyAlaSerSerValArgGlyTyrGluLeuAspSerIleGlyLeuAlaGlyPr 524
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                                                                                                                                                            449 ThrLeuGlyThrPheLeuSerSerThrAlaLeuIleArgThrSerAlaArgAlaGlyTyr 468
                                                                                                                                                                                                                                                                                        488 r-----ThrValAlaArgAspAsnAlaAspValProSerGlyLeuMetPheAr 504
                               AspLeuGlyAsnSerHisAlaThrMetLeuThrAlaSerTrpLysArgGlnLeuLeuAsn 431
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          APPLICANT: Leppla, Stephen H.
APPLICANT: Klimpel, Kurt R.
APPLICANT: Nichols, Peter J.
APPLICANT: Aroa: Naveen
APPLICANT: Singh, Yogendra
APPLICANT: Singh, Yogendra
TITLE OF INVENTION: ANTHRAX TOXIN FUSION PROTEINS AND
TITLE OF INVENTION: RELATED METHODS
                                                E: Needle & Rosenberg, P.C. 133 Carnegle Way, Suite 400
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        nLeuProPheThr------
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Sequence 9, Application US/08021601 Patent No. 5591631 GENERAL INFORMATION:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       COMPUTER READABLE FORM:
MEDIUM TYPE: Floppy disk
COMPUTER: IBM PC compatible
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                3099 AGGAGGGCTTCCTTT 3114
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CORRESPONDENCE ADDRESS:
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STATE: Georgia
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            ADDRESSEE:
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            STREET:
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               349 CATTATGTATATGCAAAAGAAGGATATGAACCCGTACTTGTAATCCAATCTTCGGAAGAT 408
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      AlaLysLeuGlyAsnThrArgAlaAlaValAsnProAspThrAlaThrValAspLeuAsn 213
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          134 IleAlaAsnValGlyValAlaIleLeuGlyAspIleLeuSerAspGlyAsnLeuAlaGlu 153
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      145 AAAGGGGAGGAAGCTGTTAAAAAAGAGGCAGAAAAAGCTACTTGAGAAAGTACCATCT 204
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            40 AAAGAGAAAATAAAGATGAGAAT------AAGAGAAAGATGAAGAACGAAAT 87
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 78 GlnGlnGluGluValLeuAspLysGluGlnThrGlyPheLeuAlaGluGluAlaProAsp 97
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         58 AspThrGlnAspSerGluIleLysAspMetValGluGluHisLeuProLeuIleThrGln 77
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112
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Patentin Release #1.0, Version #1.25
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Mismatches:
Indels:
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                                          APPLICATION NUMBER: US/08/021,601 FILING DATE: 19930212
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                                                                                                        ATTORNEY/AGENT INPORMATION:
NAME: Spratt, Gwendolyn D.
REGISTRATION NUMBER: 36,016
REFERENCE/POCKET NUMBER: 1414
TELECOMUNICATION INFORMATION:
TELEPHONE: 404/688-9880
                                                                                                                                                                                                                                                                                                                                                                                                           MOLECULE TYPE: DNA (genomic)
                                                                                                                                                                                                                                                                  INFORMATION FOR SEQ ID NO: 9: SEQUENCE CHARACTERISTICS: LENGTH: 1524 base pairs
                                                                                                                                                                                                                                                                                                                 1524 base pairs
NUCLEIC ACID
EDNESS: single
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34.80%
20.51%
3.55%
SOFTWARE: Patentin Rel
CURRENT APPLICATION DATA:
                                                                                     CLASSIFICATION: 514
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Best Local Similarity:
Query Match:
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TOPOLOGY: lir
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US-08-021-601-9
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ArgiyrrrotudinileValserGiyLeuAlaArgPheGInProGlyThrProTyrAsp 253	0-80-511
	; Sequence ; Patent
LeuAspLeuLeuAspPheGlnGlnAlaLeuGluGlnAsnGlyHisTyrSer 271	GENERA APPI APPI
AAATTTTTAGATGTATTAAATACCATTAAAAATGCATCTGATTCAGATGGACAA 558 GIVAJASerVajGinajaaropheargargienginginginginastargvajprovajtusvaj 201	APPI
	TIT :
292 SerValThrGluValLysArgHisLysLeuGluThrGlyIleArgLeuAspSerGluTyr 311	CO
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SerValValTrpAspMetAspLysTyrGluThrThrLeuAlaalaGlyIleSerGlnPro 351 ::::::::::::::::::::::::::::::::::::	₩ ₩ Ŭ Ō
ArgasnTyrargGlyasnTyrTrpThrSerasnValSerTyrasnargSerThrThrGln 371 ::: TTTAATTACATGGATAAATTTAACGAAGAAGAAATAAATCTAACGCGTGCGGCCAACGCC 780	CURI
AsnLeuGluLys	PRIC
GlyGlyIleTrpTyrValArgAspArgAlaGlyIleAspAlaArgLeu 395 	ATTG (
396GlyalaGluPheLeualaGluGlyargLysIleProGlySeraspIleAspLeu 413 	TEEL TEEL TEEL TEEL TEEL TEEL TEEL TEEL
GlyAsnSerHisAlaThrMetLeuThralaSerTrpLySargGlnLeuLeuAsn 431	SEQUENCE OF SEQUEN
AsnValLeuHisProGluAsnGlyHisTyrLeuAspGlyLysIleGlyThrThrLeuGly 451 :::	TC MOLIA HYPO
ThrPheLeuSerSerThrAlaLeuIleArgThrSerAlaArgAlaGlyTyrPhePheThr 471	PEAT
ProGluAsnLysLysLeuGlyThr	; US-08-08; US-08-08;
	Pred. No Score: Percent & Best Loca
GlyGly	Query Mat DB: US-09-857
IleGlyLeuAlaGlyProAsnGlySerValLeuProGluArgAlaLeuLeuValGlySer 538 :::	Oy 36
LeuGluTyrGlnLeuPro 544	
CATCGGTGCCG 1293	38 qa

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38 AAAACACAGGAAGAGCATTTAAAGGAAATCATG---AAACACATTGTAAAAATAGAAGTA 144
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                                     ENERAL INFORMATION:
APPLICANT: Lepplas Stephen H.
APPLICANT: Lepplas Stephen H.
APPLICANT: Klimpel, Kurt R.
APPLICANT: Arora, Naveen
APPLICANT: Singh, Yogendra
APPLICANT: Singh, Yogendra
APPLICANT: Nichols, Peter J.
TITLE OF INVENTION: Related Methods
NUMBER OF SEQUENCES: 35
CORRESPONDENCE ADDRESS:
ADDRESSEE: Townsend and Townsend and Crew LLP
STREET: Two Embarcadero Center, Eighth Floor
CITY: San Francisco
                                                                                                                                                                                                                                                                                                                                                      COMPUTER READABLE FORM:
MEDIUM TYPE: FLOPPY disk
MEDIUM TYPE: FLOPPY disk
COMPUTER: IBM PC COMPATIBLE
OPERATING SYSTEM: PC-DOS/MS-DOS
SOFTWARE: PACENTIN Release #1.0, Version #1.30
CURRENT APPLICATION DATA:
APPLICATION NUMBER: US/08/082,849B
FILING DATE: 25-JUN-1993
FILING DATE: 25-JUN-1993
FILING DATE: 12-FEB-1993
APPLICATION NUMBER: US 08/021,601
APPLICATION NUMBER: US 08/021,601
ATTORNEY/AGENT INFORMATION:
NAME: Weber, Kenneth A.
REGISTRATION NUMBER: 15280-161-1
TELECOMMUNICATION INFORMATION:
TELECOMMUNICATION INFORMATION:
TELEFRAME (415) 576-0300
TELEFRAME (A15) 576-0300
SEQUIENCE CHARACTERISTICS:
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Matches:
Conservative:
Mismatches:
Indels:
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nce 9, Application US/08082849B
E No. 5677274
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IGINAL SOURCE:
PRGANISM: Bacillus anthracis
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34.80%
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3.55%
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STRANDEDNESS: single
FOPOLOGY: linear
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LOCATION: 1,1524
OTHER INFORMATION:
082-849B-9
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    : Similarity:
ocal Similarity:
Match:
                                                                                                                                                                                                                                                                                                                                                USA
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STATE: Ca
COUNTRY:
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		111	
ολ	78 GlnGlnGluGluValLeuAspLysGluGlnThrGlyPheLeuAlaGluGluAlaProAsp 97	۸۲ ۴.	4 GIYASHSELA - -
q		Db 907	7AGCT
3		0y 432	2 AsnValLeuH
5 6	50 ASUVALLYSTITIMELLEUARIGSETLYSOLYTYTPRESETSETLYSVALSETLEUTNIGTU 11/ 205 ASUVALDARIANANANANANANANANANANANANANANANANANANA	Db 961	::: 1 CACCGCCAAC
3 8	GALGIIIIAGAGALGIAIAAAAGAAAIIGGAAAAAAAAAA	Qy 452	2 ThrPheLeuS
S 6	Lysasbolyaialyrintvalhisileint	Db 1021	1G
3	GAIGGIGAFATTACAAAACAFATATCTTTAGAAGCATTATCTGAAGAAAAAAAAAA	Qy 472	2 ProGluAsnL
Š ć		Db 1057	:::: 7CGCAGCC
3 6	ALAMANGAC TO THE TAIL THE TOP TO THE TAIL THE TA	Qy 486	6 AlaGlyTyrT
දු දු	154 TyrtyrArgAssAlaLeuGluAsnTrpGlnGlnProValGlySerAspPheAspGlnAsp 173 ::: ::: 349 CATTATGRAFACTATATGRAFATCAANCTATATGRAAATGAAAA 40R	Db 1114	 4 CTGGCCTACG
2	Serfing Denger veffreer Jan	Qy 506	6 GlyGly
; ;	OCCUPATION OF THE CONTRACTOR AND	Db 1171	1 GGTGCCCTGC
3 8	INI GINGARAN NCI GARANGOCA	Qy 519	9 IleGlyLeuA
;	154 Atomysucustynsiiiitatyataatavaiasiiriokspiiiintaiiii valaspueuksii 213 433	Db 1231	1 CTGACCCTGG
3 8		Qy 539	9 LeuGluTyrG
3 7	ValValValAspserGlyArgProileAlaPheGlyAspPheGluileThrGlyThrGin	Db 1282	2CATC
Ω	439 GTTTATTATGAAATAGGTAAGATATTATCA	5 P.1112-44	,
ΟŸ	234 ArgTyrProGluGlnIleValSerGlyLeuAlaArgPheGlnProGlyThrProTyrAsp 253	PCT-US94	RESOLL 32 PCT-US94-01624-9 ; Sequence 9, Applic
q	469AGGGATATTTAAGTAAAATTAATCAACCATATCAG 504	GENER	GENERAL INFORMATI
ò	254LeuAspLeuLeuLeuAspPheGlnGlnAlaLeuGluGlnAsnGlyHisTyrSer 271	APP	
q	505 AAATTTTAGATGTATTAAATACCATTAAAAATGCATCTGATTCAGATGGACA 558	A A P P	
ò	272 GlyAlaSerValGlnAlaAspPheAspArgLeuGlnGlyAspArgValProValLysVal 291	; APP	APPLICANT: NIC TITLE OF INVENT
q	559	; TITLE ; NUMBE	TITLE OF INVENT NUMBER OF SEQUE
ò	292 ServalThrGluValLysArqHisLysLeuGluThrGlyIleArqLeuAspSerGluTyr 311	COR:	CORRESPONDENCE ADDRESSEE: 7
අ			STREET: Steu
i			ITY: San Fr
<u> </u>	olyLeuclyolyLyslleAlalyTaSpTyTTyTSnLeuPheasnLysclyTyTLeuTy		TATE: CA OUNTRY: USA
Q C		, , COM	ZIP: 94105 MPUTER READAE
ò	332 ServalvalTrpAspMetAspLysTyrGluThrThrLeuAlaAlaGlyIleSerGlnPro 351	× 0	MEDIUM TYPE: COMPUTER: IE
අු	664GCATATTATCGAGCCACACCATCGTGTTTTACAGCTTTATGCACCGGAAGCT 720		03
οy	352 ArgAsnTyrArgGlyAsnTyrTrpThrSerAsnValSerTyrAsnArgSerThrThrGln 371	; CUR	CURRENT APPLICA
g	721 TITAATTACAIGGATAAATTTAACGAACAAGAAATATAAATCTAACGCGTGCGGCCAACGC 780	∢	APPLICATION N FILING DATE:
ò	372 AsnLeuGluLys379	, ATT	CLASSIFICATIC ATTORNEY/AGENT
q	11 11 11 11 11 11 11 1		NAME: Weber, REGISTRATION
ò	380 GlyGlyIleTrpTyrValArgAspArgAlaGlyIleAsoAlaArgLen 395	R. T.	REFERENCE/DOCTEL/FCOMMINICATI
g G	GAGCGCAACTAT		TELEPHONE: (41
è		; INFOR	INFORMATION FOR
; a	CCACTGGCGCGGATTCCTCGGCGACGCGCGCACGTC) } !	SEQUENCE CHARAC LENGTH: 1524 TYPE: nuclei
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                                                                                                                                                                                 isProGluAsnGlyHisTyrLeuAspGlyLysIleGlyThrThrLeuGly 451
HisalaThrMetLeuThrAlaSerTrp----LysArgGlnLeuLeuAsn 431
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COWNSEND and TOWNSEND KHOURIE and CREW
LART Street Tower, 20th Ploor, One Market
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impel, Kurt R.
ora, Naveen
ora, Naveen
ohly, Yogendra
chols, Peter J.
TION: ANTHRAX TOXIN FUSION PROTEINS AND
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TBM PC compatible
SYSTEM: PC-DOS/MS-DOS
PatentIn Release #1.0, Version #1.25
TGATION DATA:
N NUMBER: PCT/US94/01624
E: June 25, 1993
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12. Kenneth A.

13. Kanneth A.

14. NUMBER: 15.20-115.

15. VION INFORMATION:

14. Standard:

15. Seq ID NO: 9:

16. Seq ID NO: 9:

17. Dass pairs

18. Seq Id Seq
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                                                                                                                                                                                                                                                                                                                                                LysAsnLysSerProAspThrGluSerValLysLeuLysProLysPheProValArgIle
                                                                                                                                                                                                                                                                                                                                                                                                            58 AspThrGlnAspSerGluIleLysAspMetValGluGluHisLeuProLeuIleThrGln
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"LF(1-254)--TR--PE(362-613)"
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Matches:
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                                                            Bacillus anthracis
             MOLECULE TYPE: DNA (genomic)
HYPOTHETTCAL: NO
ORIGINAL SOURCE:
ORGANISM: Bacillus anthrac
                                                                                                                                                                                                     0.0189
112.50
34.80%
20.51%
3.55%
                                                                                                        LOCATION: 1.1524
OTHER INFORMATION:
OTHER INFORMATION:
linear
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Best Local Similarity:
                                                                                             NAME/KEY:
                                                                                                                                                                                        Alignment Scores:
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961 CACCGCCAACTGGAGGAGGGGGCTATGTGTTCGTCGGCTACCACGCCACCTTCCTCGAA 1020
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                     GlyLeuGlyGlyLysIleAlaTyrAspTyrTyrAsnLeuPheAsnLysGlyTyrIleGly
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APPLICANT: Spatiling, P. Frederick
APPLICANT: Cornelissen, Cynthia N.
TITLE OF INVENTION: Transferrin-Binding
TITLE OF INVENTION: Neisseria Gonorrhea
NUMBER OF SEQUENCES: 8
CORRESPONDENCE ADDRESS:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        ; Sequence 1, Application US/08363124A; Patent No. 5912336
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181
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Mismatches:
Indels:
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Matches:
                                                                                                                                                                                       CLASSIFICATION: 3.0
PRIOR APPLICATION DATA:
APPLICATION NUMBER: US 08/124,254
FILING DATE: 20-SEP-1993
PRIOR APPLICATION DATA:
APPLICATION DATA:
APPLICATION DATA:
APPLICATION NUMBER: US 07/973,336
FILING DATE: 05-NOV-1992
PRIOR APPLICATION DATA:
APPLICATION NUMBER: US 07/572,187
FILING DATE: 23-A0G-1990
ATTORNEY AGENT INFORMATION:
NAME: GALlagher: Thomas C.
REGISTRATION NUMBER: 37,066
REFERENCE/DOCKET NUMBER: SPA-1-PDC
TELECOMMUINCATION INFORMATION:
TELEPHONE: (212) 645-105
TELEPHONE: (212) 645-2054
INFORMATION FOR SEG ID NO: 1:
SEQUENCE CHARACTERISTICS:
LENGTH: 3286 base pairs
TYPE: nucleic acid
STRANDEDNESS: double
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Length:
                                                                                                                                        CURRENT APPLICATION DATA:
APPLICATION NUMBER: US/08/363,124A
FILING DATE: 23-DEC-1994
CLASSIFICATION: 536
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STRAIN: FA19
                                                                    COMPUTER READABLE FORM:
MEDIUM TYPE: RIOPPy disk
COMPUTER: IBM PC compatible
OPERATING SYSTEM: PC-DOS/MS-
STREET: 180 Varick Street
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       FRAGMENT TYPE: N-terminal ORIGINAL SOURCE:
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112.00
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                            New York
: USA
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Best Local Similarity:
Query Match:
               New York
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LOCATION:
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--LysGluGlnThrGlyPheLeuAlaGluGluAlaProAspAsnValLy 100
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                                                        633 cceceaccreacecerraceacccceecarceccercerceacagesececesecaag
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                                                                                         -----GGCATCGGTTTGGACAACCATTTTCAGCAGAC 1736
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389 aGly11eAspAlaArgLeuGlyAlaGluPheLeuAlaGluGlyArgLys11eProGlySe 409
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                                                                 rAspIleAspLeuGlyAsnSerHisAlaThrMetLeuThrAlaSerTrpLysArgGlnLe
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Patent No. 5741697
GENERAL INFORMATION:
APPLICANT: Bayoil, Patrik M.
APPLICANT: Basoil, Patrik M.
APPLICANT: BASOIL Ru-ching
TITLE OF INVENTION: BACTERIOPHAGE OF CHLAMYDIA PSITTACI
NUMBER OF SEQUENCES: 3
CORRESPONDENCE ADDRESS:
ADDRESSEE: Nixon, Hargrave, Devans & Doyle LLP,
                                GCACACCAAAAGCCGCTACGGTTTGGAATATGTC-
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MEDIUM TYPE: Floppy disk
COMPUTER: IBM PC compatible
OPERATING SYSTEM: PC-DOS/MS-DOS
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US-08-565-386-10
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352 TATTTTGTTCCTCAAGTAACTTCTCCTGATGGAGGTTACGCAGAGAATTCTATTATGAC 411
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Glu------AlaProAspAsnValLysThrMetLeuArgSerLys-----GlyTyr 108
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    PheSerSerLysValSerLeuThrGluLysAspGlyAlaTyrThrValHisIleThrPro 128
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   129 GlyProArgThrLysIleAlaAsnValGlyValAlaIle------LeuGlyAspIle 145
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             185 Alaval------ThrArgLySGlyTyrProLeu-------AlaLys 195
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          196 LeuGlyAsnThrArgAlaAlaValAsnProAspThrAlaThrValAspLeuAsnValVal 215
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         146 LeuSerAspGly---AsnLeuAlaGluTyrTyrArgAsnAlaLeuGluAsnTrpGlnGln 164
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               ProvalGlySerAspPheAspGlnAspSerTrpGluAsnSerLysThrSerValLeuGly 184
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       14 PhePhePheProHisAlaTyrAlaProAlaAlaAspLeuSerGluAsnLysAlaAlaGly 33
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      LeuIleThrGlnGlnGlnGluGluValLeuAspLysGluGlnThrGlyPheLeuAlaGlu 93
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          766 TCTGATGATCAGTTTAGTTTTGGTGTTTCTTATGTAAACGCTTCACAGAAATGG-----
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           PheAlaLeuPheLysAsnLysSerProAspThrGluSerValLysLeuLysProLysPhe
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107
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214
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PatentIn Release #1.0, Version #1.30
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Mismatches:
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Indels:
                                                                                                                                          176/60040
                CURRENT APPLICATION DATA:
APPLICATION NUMBER: US/08/565,386
                                                                                   ATTORNEY/ACENT INFORMATION:
NAME: Timlan, Susan J.
REGISTRATION NUMBER: 34,103
REFERENCE/DOCKET NUMBER: 176/1
TELECOMMUNICATION INFORMATION:
TELEFAX: 716-263-1636
TELEFAX: 716-263-1636
INFORMATION FOR SEQ ID NO: 10:
SEQUENCE CHARACTERISTICS:
LENGTH: 1791 base pairs
TYPE: nucleic acid
STRANDEDNESS: single
                                                                                                                                                                                                                                                                                                     TOPOLOGY: circular
MOLECULE TYPE: DNA (genomic)
US-08-565-386-10
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111.50
35.60%
23.52%
3.51%
                                                                      CLASSIFICATION: 435
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Best Local Similarity:
                                                                                                                                                                                                                                                                                                                                                                         Alignment Scores:
Pred. No.:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Query Match:
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231 GlyThrGlnArgTyrProGluGlnIleValSerGlyLeuAlaArgPheGlnProGlyThr		309 SerGluTyrGlyLeuGlyGlyLysIleAlaTyrAspTyrTyrAsnLeuPheAsn ::!	343 ThrLeualaAlaGlylleSerGlnProArgAsnTyr	Oy 373 LeuGluLysArgAlaPheSerGlJyGlylleTrpTyrValArgAspArgAlaGlylleAsp 392 ::	RESULT 37 US-08-164-292B-15 US-08-164-292B-15 Sequence 15, Application US/08164292B Security No. 5820868 GENERAL INFORMATION: APPLICANT: MITTAL, SURESH K. APPLICANT: GRAHAM, FRANK L. APPLICANT: PREVEC LUDVIK	DABLON, LORDE NVENTION: RECON NVENTION: ADENC SEQUENCES: 34 ENCE ADDRESS: E: MORRISON & F 345 California Reancisco California USA 104 - 2675 EADABLE FORM:	STE
bb 9978 AAGGGCAGTTATTTTACCGGCGCAGCCTGCAATAAACAGGCTGCTAACAGCACACAGAAT 10037 Qy 373 LeuGluLysArgAlaPheSerGlyGlyIleTrpTyrValArgAspArgAlaGlyIleAsp 392 ii: bb 10038 GGTGTCACCTTCATGTACCCAGGT	SULT 36 -09-090- Sequence Patent N SENERAL APPLICA TITLE C	CURRENT FILING NUMBER: US/09/090,793 CURRENT FILING DATE: 1998-06-04 EARLIER APPLICATION NUMBER: 60/048,650 EARLIER FILING DATE: 1997-06-04 NUMBER OF SED NOS: 66 SOFTWARE: Patentin Ver: 2.0 SOFTWARE: 40138 TYPE: DNA	3-12 3-12 ores: 4.58 11.50 larity: 35.29% imilarity: 20.59%	Indels:	96ProAspAsnValLysThrMetLeuArgSerLysGlyTyrPheSer	Oy 131 ArgThrLyslleAlaAsnValGlyValAlaIleLeuGlyAspIleLeuSerAspGlyAsn 150 15:::::: 26325 TTTCACAGGTCGCAGGTTTATTGAAATGTGTAATTGGT	26475 TTCCCACATGCTGCTGCACATTGCCGCTTATAGTTGTGTGACTGCTGACAGC 211 AspLeuAsnValValAspSerGlyArgProlleAlaPheGlyAspPheGluIleThr ::::::::::::::::::::::::::::::::::::

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2299 AATGCTCTCCAGGTCCACACAGGCGCACACGGTCACGGTAACCGATGACAAGGTGTCTCTA 2358
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          2359 AATACCCAAGCTCCCCTCTCGACCACCAGCGGGGCCTCTCCCTACTTCTGGGTCCCCAGC 2418
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   2458 ------GGAGCGGCCCTCCAAATTAGCAATAACGCTCTGCCCGTAAAAGTAGGTTCA 2508
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           109 PheSerSerLysValSerLeuThrGluLysAspGlyAlaTyrThrValHisIleThrPro 128
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       129 GlyProArgThrLysIleAlaAsnValGlyValAlaIleLeuGlyAspIleLeuSerAsp 148
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           149 GlyAsnLeuAlaGluTyrTyrArgAsnAlaLeuGluAsnTrpGlnGlnProValGlySer 168
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             169 AspPheAspGlnAspSerTrpGluAsnSerLysThrSerValLeuGly-----Ala 185
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       89 GlyPheLeuAlaGluGluAlaProAspAsnValLysThrMetLeuArgSerLysGlyTyr 108
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     3 IleLysProThrAlaLeuLeu------LeuProAlaLeuPhePheProHis 18
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     19 AlaTyrAlaProAlaAlaAspLeuSerGluAsnLysAlaAlaGlyPheAlaLeuPheLys 38
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  54 ---ProValArgileAspThrGlnAsp------SerGluIleLysAspMetVal 68
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    69 GluGluHisLeuProLeuIleThrGlnGlnGlnGluGluValLeuAspLysGluGlnThr 88
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Matches:
Conservative:
Mismatches:
Indels:
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            NAME: GRACEY, NANCY J.
REGISTRATION NUMBER: 29.216
RECEDENCE/DOCKET NUMBER: 29310-20021.00
TELECOMMUNICATION INFORMATION:
TELEPHONE: (415) 677-7000
TELEFAX: (415) 677-7522
TELEX: 34-0154
INFORMATION FOR SEQ ID NO: 15:
SEQUENCE CHARACTERISTICS:
LENGTH: 5100 base pairs
TYPE: nucleic acid
STRANDEDNESS: double
TOPOLOGY: linear
                                                                                                                                                                                                                                                                                                                                                                                                                                      Gaps:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            2562 -----
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ATTORNEY/AGENT INFORMATION:
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34.04%
22.19%
3.50%
                                                                                                                                                                                                                                                              ) NAME/KEY: CDS
; LOCATION: 2..418
US-08-164-2928-15
                                                                                                                                                                                                                                                                                                                                                                 Score:
Percent Similarity:
Best Local Similarity:
Query Match:
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Pred. No.:
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රු පු	206	AspTnrAlaTnrValAspLeuAsnValValValAspSerGlyArgProlleAlaPheGly 225
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දු දු	2722	ASPFREGILLEETREITYINFGINAEGTYFFRGEIUGINILEVALSEFLYLEUAAAAFIG 245 :::: :: AGCCTCGCCGTGCAT 2754
Οy	246	PheGlnProGlyThr 256
QQ	2755	TITCCCCCTGGCCAAAACCAAGTAAGCCTTTATCCCGGAGATGGAATAGACATCCGAGAT 2814
ò	257	
QQ	2815	AATAGGGTGACTGTGCCCCCTGGGCCTGAGAATGCTCAACCACCAACTTGCCGTA 2874
δλ	265	GluGlnAsnGlyHisTyrSerGlyAlaSerValGlnAlaAspPheAspArgLeuGlnGly 284
q	2875	GCT
οy	285	pArgValProValLysValSerValThrGluValLysArgHisLysLeu 301 ::: :::
ය දු	2914	TTTGAAAATGGCGCCGTACGAGCAAAACT
ογ	302	GluThrGlyIleArgLeuAspSerGluTyrGlyLeuGlyGly 315
QQ	2971	ACTIGGCACAGACGACTCTGGTCGGTCCGTGGTTCGCACAGGTCGA
ΟŅ	316	-
QQ	3031	AGAGTIGCAAACGGCCAAGTCCAGATCTTCAGCGGAAGAGGCACCGCCATCGGCACT 3087
οy	334	ValTrpAspMetAspLysTyrGluThrThrLeuAlaAlaGlyIleSerGlnProArgAsn 353
g	3088	
οy	354	TyrArgGlyAsnTyrTrpThrSerAsnValSerTyrAsnArgSerThrThrGlnAsnLeu 373
qq	3127	TITICIGACCCGCCITGACIGCTAGITICCAAGGCAGIGGICCGATTACTTACAACAGC 3186
οy	374	GluLysArgAlaPheSerGlyGlyIleTrpTyrValArgAspArgAla 389
ф	3187	AACAATGGCACTTTCGGTCTCTGTATAGGCCCCGGAATGTGGGTAGACCAAAACAGACTT 3246
٥'n	390	GlyIleAspAlaArgLeuGlyAlaGluPhe
q	3247	CAGGTAAACCCAGGCGCTGGTTTAGTCTTCCAAGGAAACAACCTTGTCCCAAAACCTTGGG 3306
٥y	402	GluGlyArgLysIleProGlySerAspIleAspLeuGlyAsnSer 416
qq	3307	GAICCGCTGGCTATTTCCGACAGCAAAATTAGTCTCAGTCTCGGTCCCGGCCTGACCCAA 3366
Qy	417	HisAlaThrMetLeuThrAlaSerTrpLysArgGlnLeuLeuAsnAsnValLeuHisPro 436
qq	3367	GGAAACGGGCT
φ	4.37	GluAsnGlyHisTyrLeuAspGlyLysIleGlyThrThrLeuGlyThrPheLeuSerSer 456
Op	3412	TCCAATCAAGCCGTTGCTATAAAAGCGGGCCGGGGCTTACGCTTTGAGTCTTCC 3465
ολ	457	ThralaLeulleArgThrSerAlaArgAlaGlyTyrPhePheThrProGluAsnLysLys 476
q	3466	TCACAAGCTTTAGAGAGCAGCCTCACAGTCGGAAATGGCTTAACG3510
ò	477	LeuGlyThrPheilelleArgGlyGlnAlaGlyTyrThrValAlaArgAspAsn 494
qq	3511	CTTACCGATACTGTGTCCGCCCCAACCTAGGGGACGCCTAGAGGTCAGAGACAATAAA 3570
Οy	495	AlaAspValProSerGlyLeuMetPheArgSerGlyGlyAlaSerSerValArg 512
qq	3571	ATCATTGTTAAGCTGGGCGCGAATCTTCGTTTTGAAAACGGAGCCGTAACCGCC 3624

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3774
                                                                                                         3664 CTCACTGCAGAACCACCCTCCGAGCCTCCAACTCCCATCTTCAACTGTCCCTATCG--- 3720
                                        -----GGCACCGTTAACCCTTCTGCGCCCGAGGCACCACCAACT 3663
                                                                                                                                                                                                     -----GAGGGCTTGGTTGTGCATAACAACGCCCTTGCTCTCCAACTGGGAGACGCCATG
513 GlyTyrGluLeuAspSerIleGlyLeuAlaGlyProAsnGlySerValLeuPro----
                                                                              -----GluArgAlaLeuLeuValGlySerLeuGluTyrGlnLeuProPheThrArg
                                                                                                                                                                 ----MetGlyAspAla---
                                                                                                                                                                                                                                                                                 3775 GAAGTAAATCAGCACGGACTTACTTTAAGAGTAGGCTCGGGTTTGCAAATGCGT 3828
                                                                                                                                                                                                                                             AlaAlaAsnPheLysArgMetLysLeuLysHisGlySerGlyLeuGlyValArg 578
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             RECOMBINANT PROTEIN PRODUCTION IN BOVINE ADENOVIRUS EXPRESSION VECTOR SYSTEM
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146
78
260
174
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MEDIUM TYPE: Floppy disk
COMPUTER: Floppy disk
COMPUTER: Ploppy disk
COMPUTER: SYTEM: PC-DOS/MS-DOS
COFTWARE: Patentin Release #1.0, Version #1.30
CURRENT APPLICATION NATA:
APPLICATION NUMBER: US/08/164,292B
FILING DATE: 09-DEC-1993
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Length:
Matches:
Conservative:
Mismatches:
Indels:
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                                                                                                                                                                                                                                                                                                                                                         Sequence 17, Application US/08164292B
Patent No. 5820868
GENERAL INFORMATION:
APPLICANT: MITTAL, SURESH K.
APPLICANT: GRAHAM, FRANK L.
APPLICANT: BREVEC, LUDVIK
APPLICANT: BABIUK, LORNA A.
TITLE OF INVENTION: RECOMBINANT PROT
TITLE OF INVENTION: ADENOVIRUS EXPRE
NUMBER OF SEQUENCES: 34
CORRESPONDENCE ADDRESS:
ADDRESSEE: MORRISON & FOERSTER
                                                                                                                                                            548 ThrLeuSerGlyAlaValPheHisAsp---
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          ADDRESSEE: MORRISON & FOERSTER
STREEF: 345 California Street
CITY: San Francisco
STATE: California
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 CLASSIFICATION: 435
ATTORNEY/AGENT INFORMATION:
NAME: GRACEY, NANCY J.
REGISTRATION NUMBER: 28.216
REFERENCE/DOCKET NUMBER: 2931
TELECOMMUNICATION:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  TELEPHONE: (415) 677-7000
TELERAX: (415) 677-7522
TELERX: 34-0154
INFORMATION FOR SEQ ID NO: 17:
SEQUENCE CHARACTERISTICS:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          MOLECULE TYPE: DNA (genomic)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         LENGTH: 5100 base pairs
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22.19%
3.50%
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Query Match:
DB:
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                ; NAME/KEY:
; LOCATION:
US-08-164-2928-17
                                                                                                                                                                                                                                                                                                                                            US-08-164-292B-17
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US-09-857-669-2 (1-609) x US-08-164-292B-17 (1-5100)

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1131 ATTAACCCCGCGGGGTTCTGCAGACAAACGACCTGCGTGTCTCTTCCCACGGTG 2190
                                                                                                      GCCTCCGATGAGGCCGGCAACGTCACGCTCAACATGTCTGACGGGCTATATACTAAGGAC 2250
                                                                                                                                                                            AACAAGCTA------GUTGTCAAAGTAGGTCCCGGGCTGTCCCTCGACTCCAAT 2298
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------GGAGCGGGCCTCCAAATTAGCAATAACGCTCTGGCCGTAAAAGTAGGTTCA 2508
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           149 GlyAsnLeuAlaGluTyrTyrArgAsnAlaLeuGluAsnTrpGlnGlnProValGlySer 168
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                169 AspPheAspGlnAspSerTrpGluAsnSerLysThrSerValLeuGly-----Ala 185
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     ValThrArgLysGlyTyrProLeuAlaLysLeuGlyAsnThrArgAlaAlaValAsnPro 205
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-- LeuProAlaLeuPhePheProH1s 18
                                                                    19 AlaTyrAlaProAlaAlaAspLeuSerGluAsnLysAlaAlaGlyPheAlaLeuPheLys 38
                                                                                                                                                                                                                ---ProvalArgIleAspThrGlnAsp------SerGluIleLysAspMetVal 68
                                                                                                                                                                                                                                                                                   GluGluHisLeuProLeuIleThrGlnGlnGlnGluGluValLeuAspLysGluGlnThr 88
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                                                                                                                                           AsnLysSerProAspThrGluSerValLysLeuLysProLysPhe-----
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 3 IleLysProThrAlaLeuLeu-
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                                                                          3031 AGAGTTGCAAACGGCCAAGTCCAGATCTTCAGCGGAAGAGCACCGCCATCGGCACT--- 3087
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316 LyszleAlaTyrAspTyrTyrAsnLeuPheAsn---LysGly---TyrIleGlySerVal 333
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APPLICANT: PREVEC, LUDUVIK
APPLICANT: BREVEC, LOUDVIK
APPLICANT: BABIUK, LORNE A.
TITLE OF INVENTION: RECOMBINANT PROTEIN PRODUCTION IN BOVINE
TITLE OF INVENTION: ADENOVIRUS EXPRESSION VECTOR SYSTEM
CORRESPONDENCE ADDRESS:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           390 GlyIleAspAlaArgLeuGlyAlaGluPhe-
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Patent No. 5820868
GENERL INFORMATION:
APPLICANT: MITTAL, SURESH K.
APPLICANT: GRAHAM, FRANK L.
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US-08-164-292B-19
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-------GGAGCGGCCTCCAAATTAGCAATAACGCTCTGGCCGTAAAAGTAGGTTCA 2508
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            2359 AATACCCAAGCTCCCCTCTCGACCACCAGCGGGCCTCTCCCTACTTCTGGGTCCCAGC 2418
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            2131 ATTAACCCCGCGGGGCTTCTGGAGACAACGACCTCGCGTCCGCTGTCTTCCCACCGCTG 2190
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             251 AACAAGCTA-----GCTGTCAAAGTAGGTCCCGGGCTGTCCCTCGACTCCAAT 2298
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              89 GlyPheLeuAlaGluGluAlaProAspAsnValLysThrMetLeuArgSerLysGlyTyr 108
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        PheSerSerLysValSerLeuThrGluLysAspGlyAlaTyrThrValHisIleThrPro 128
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       88
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       GluGluHisLeuProLeuIleThrGlnGlnGlnGluGluValLeuAspLysGluGlnThr
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   19 AlaTyrAlaProAlaAlaAspLeuSerGluAsnLysAlaAlaGlyPheAlaLeuPheLys
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 ...ProValArgIleAspThrGlnAsp......SerGluIleLysAspMetVal
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    2419 CTCCACTTAGGTGAGGAGGACGACTAACAGTAAACACC-------
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           AsnLysSerProAspThrGluSerValLysLeuLysProLysPhe-----
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            5100
146
78
260
174
36
                                                                                                                                                           SOFTWARE: Patentin Release #1.0, Version #1.30 CURRENT APPLICATION DATA:
FILLING DATE: US/08/164,292B FILLING DATE: 09-DEC-1993
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Conservative:
Mismatches:
Indels:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       US-09-857-669-2 (1-609) x US-08-164-292B-19 (1-5100)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Length:
Matches:
                                                                                                                                                                                                                                                                                      28,216
ER: 29310-20021.00
                                                                                                                                                                                                                                       CLASSIFICATION: 4.5

ATTORNEY FAGENT INFORMATION:
NAME: GRACEY, NANCY J.
REGISTRATION NUMBER: 28,216
REFERENCE/DOCKET NUMBER: 2931C
TELECOMMUNICATION INFORMATION:
TELEFAX: (415) 677-7020
TELEFAX: (415) 677-7522
TELEFAX: 34-0154
INFORMATION FOR SEQ ID NO: 19:
SEQUENCE CHARACTERISTICS:
LENGTH: 5100 base pairs
345 California Street
                                                                                                          E: Floppy disk
IBM PC compatible
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               MOLECULE TYPE: DNA (genomic)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           3 IleLysProThrAlaLeuLeu-
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             111.00
34.04%
22.19%
3.50%
                                                                                                                                                                                                                                                                                                                                                                                                                                                           TYPE: nucleic acid
STRANDEDNESS: double
                                                                      ZIP: 94104-2675
COMPUTER READABLE FORM:
MEDIUM TYPE: Floppy o
                 San Francisco
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    CDS
529..954
                                     California
                                                                                                                                          OPERATING SYSTEM:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Best Local Similarity:
Query Match:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Percent Similarity:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       US-08-164-292B-19
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   NAME/KEY:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Alignment Scores:
Pred. No.:
STREET:
CITY: Sat
STATE: Ca
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δ	129 GlyProArgThrLysIleAlaAsnValGlyValAlaIleLeuGlyAspIleLeuSerAsp	Db 34
9 :	2509 GGTATCACCGTAGATGCTCAAAACCAGCTCGCTGCTGCCTGGGGGGGG	Oy 4
à á	149 GIYABBLEUALAGAUTYTIYTATGASBAIALEUGLUABBTTFPGINGIRFTOVALGIYSEF	Db 34
a d	7507	0y 4
à á	159 AsprheAspCinAspSerIrpGluAshSerLysThrSerValLeuGlyAla 185	DD 35
<u>a</u>	2553GAAAGCAGAGATAATAAAACTGTCGTTAAGGCTGGGCCCGGACTTACA	0y 4
ð á	186 ValThrArgLySGLyTyrProLeuAlaLysLeuGlyAsnThrArgAlaAlaAlaNalAsnPro	Db 35
2	ZOLI ALAACTAATCAAGCICTTACTGTTGCTACCGGGAACGGCCTTCAGGTCAACCCG	0.07
8 8	206 AspfhrAlafhrValAspLeuAsnValValValValAspSerGlyArgProlleAlaPheGly	9E QU
<u> </u>	2005 GAA***-GGGCAACTGCAGCTAAACATTACTGCCGGTCAGGCCCTCAACTTTGCAAACAAC	Q.Y 5
ð í	226 AspPheGlulleThrGlyThrGlnArgTyrProGluGlnIleValSerGlyLeuAlaArg 7277 ACCOMMON TO THE TAXABLE TO	Db 36
9	Z/ZZ AGCCICGCCG16	2 00
ò	246 PheGlnProGlyThr	m
g	2755 TITCCCCCTGGCCAAAACCAAGTAAGCCTTTATCCCGGAGATGGAATAGACATCCGAGAT 2814	, °C
δ	257	~
В	2815 AATAGGGTGACTGTGCCCGCTGGGCCAGGCCTGAGAATGCTCAACCACCACCAGCTTGCGTA 2874	
δy	265 GluGlnAsnGlyHisTyrSerGlyAlaSerValGlnAlaAspPheAspArgLeuGlnGly 284	RESULT US-08-1
QQ	2875 GCT1CCGGAGACGGTTTAGAAGTCCACAGGGACACCCTC 2913	; Seque ; Paten
οy	285	CENE:
QQ	2914CGGTTAAAGCTCTCCCACGCCTGACATTTGAAAATGGCGCCGTACGAGCAAAACTA 2970	A A P
ογ	302	4 F E
QQ	2971 GGACCAGGACTTGGCACAGACGACTCTGGTCGGTGGTTCGCACAGGTCGAGGACTT 3030	II.
ογ	316	
g	3031 AGAGTIGCAAACGGCCAAGTCCAGAICTTCAGGGGA	
δλ	334 ValTrpAspMetAspLy	
q	3088	8
ογ	354	••••
og G	3127 TTTCTGGACCCGCCTTGACTGCTAGTTTGCAAGGCAGGGTCGTCCGATTACTTAC	
οy	374	
QQ	3187 AACAATGGCACTTTCGGTCTCTATAGGCCCCGGAATGGGGTAGACCAAAACAGACTT 3246	
ογ	390	
q	3247 CAGGTAAACCCAGGCGCTGGTTTAGTCTTCCAAGGAAACAACCTTGTCCCAAACCTTGCG 3306	•• ••
ò	402	
Ωp	3307 GATCCGCTGGCTATTTCCGACAGCAAATTAGTCTCAGTCTCGGTCCCGGCCTGACCCAA 3366	CONT
ò	417 HisAlaThrMetLeuThrAlaSerTrpLysArgGlnL	as :
g	3367	
οχ	437 GluAsnGlyHisTyrLeuAspGlyLysIleGlyThrThrLeuGlyThrPheLeuSerSer 456	_

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466 TCACAAGCTTTAGAGAGCAGCTCACACTCGGAAATGGCTTAACG------- 3510
                                                                                                                                                                                                    571 ATCATTGTTAAGCTGGGGGGAATCTTGTTTGAAAAAGGAGCCGTAACGGCG----- 3624
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       664 CTCACTGCAGAACCACCCCTCCGAGCCTCCAACTCCCATCTTCAACTGTCCCTATCG--- 3720
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       721 -----GAGGGCTTGGTTGTGCTAAACACGCCCTTGCTCTCCAACTGGGAGACGGCATG 3774
                                                                                                                                                                  477 LeuGlyThrPheileileArgGlyGlnAlaGlyTyrThrVal---AlaArgAspAsn--- 494
                                                                                                                                                                                                                                                                    495 -----AlaAspValProSerGlyLeuMetPheArgSerGlyGlyAlaSerSerValArg 512
                                                                                                                                                                                                                                                                                                                                                                         513 GlyTyrGluLeuAspSerIleGlyLeuAlaGlyProAsnGlySerValLeuPro---- 530
                                                                     457 ThralaLeulleArgThrSerAlaArgAlaGlyTyrPhePheThrProGluAsnLysLys 476
                                                                                                                                                                                                                                                                                                                                                                                                                                                                      531 ------GluArgAlaLeuLeuValGlySerLeuGluTyrGlnLeuProPheThrArg 547
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        548 ThrLeuSerGlyAlaValPheHisAsp------560
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     PPLICANT: MITTAL, SURESH K.
PPLICANT: GRAHAM, FRANK L.
RPLICANT: BREVEC, LUDVIK
PPLICANT: BABIUK, LORNE A.
TTLE OF INVENTION: RECOMBINANT PROTEIN PRODUCTION IN BOVINE
ITLE OF INVENTION: ADENOVIRUS EXPRESSION VECTOR SYSTEM
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             COUNTRY: USA
21F: 94104-2675
COMPUTER READABLE FORM:
MEDIUM TYPE: Floppy disk
COMPUTER: IBM PC compatible
OOPERATING SYSTEM: PC-DOS/MS-DOS
SOFTWARE: PatentIn Release #1.0, Version #1.30
CURRENT APPLICATION DATA:
APPLICATION NUMBER: US/08/164,292B
FILLNG DATE: 09-DEC-1993
CLASSIFICATION: 435
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        28,216
ER: 29310-20021.00
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nt No. 5820868
ERAL INFORMATION:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                MORRISON & FOERSTER
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    STREET: 345 California Street
CITY: San Francisco
STATE: California
COUNTRY: USA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 ATTORNEY AGENT INFORMATION:
NAME: GRACEY, NANCY J.
REGISTRATION NUMBER: 28,216
REFERENCE/DOCKET NUMBER: 2931
TELECOMMUNICATION INFORMATION:
TELECOMMUNICATION INFORMATION:
TELEX: 34-0154
NFORMATION FOR SEQ ID NO: 21:
SEQUENCE CHARACTERISTICS:
LENGTH: 5100 base pairs
TYPE: nucleic acid
STRANDEDNESS: double
TOPOLOGY: linear
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               UMBER OF SEQUENCES: 34
ORRESPONDENCE ADDRESS:
ADDRESSEE: MORRISON &
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    164-292B-21
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			18 · 2190	38 2250	53 2298	35	88 2418	108	128	2508	148 2562	168	2562	185 2610	205 2664	225 2721	245	2754	256	2814	264
MOLECULE TYPE: DNA (genomic) FEATURE: NAME/KEY: CDS LCCATION: 12461707 S-08-164-292B-21	Alignment Scores: Pred. No.: Score: 111.00 Matches: 146 Percent Similarity: 34.048 Conservative: 78 Mismatches: 1508 Indels: 174 Gaps: 160	S-09-857-669-2 (1-609) x US-08-164-292B-21 (1-5100)	3 IleLysProThralaLeuLeuLeuProalaLeuPhePhePheProHis	19 AlaTyralaProAlaAlaAspLeuSerGluAsnLysAlaAlaGlyPheAlaLeuPheLys	39 AsnLysSerProAspThrGluSerValLysLeuLysProLysPhe	54PiroValArgileAspThrGlnAspSerGluIleLysAspMetVal ::::::::::	69 GluGluHisLeuProLeuIleThrGlnGlnGlnGluGluValLeuAspLysGluGlnThr	89 GlyPheLeuAlaGluGluAlaProAspAsnValLysThrMetLeuArgSerLysGlyTyr 	109 PheSerSerLysValSerLeuThrGluLysAspGlyAlaTyrThrValHisIleThrPro	2458GGAGCGGCCTCCAAATTAGCAATAACGCTCTGGCCGTAAAAGTAGGTTCA	129 GlyProargThrLysIlealaasnValGlyValalaIleLeuGlyAspIleLeuSerAsp	149 GlyasnLeualaGluTyrTyrArgAsnAlaLeuGluAsnTrpGlnGlnProValGlySer	2562	169 AspPheAspGlnAspSerTrpGluAsnSerLysThrSerValLeuGlyAla ::: ::: ::: 2563GAAAGCAGAGATAATAAAACTGTCGTTAAGGCTGGGCCCGGACTTACA	186 ValThrargLysGlyTyrProLeuAlaLysLeuGlyAsnThrargAlaAlaValAsnPro :::	206 AspThralaThrValAspLeuAsnValValValAspSerGlyArgProlleAlaPheGly :::	226 AspPheClulleThrGlyThrGlnArgTyrProGluGlnIleValSerGlyLeuAlaArg	2722 AGCCTCGCCGTG	246 PheGlnProGlyThr	2755 TTTCCCCCTGGCCAAAACCAAGTAAGCCTTTATCCCGGAGATGGAATAGACATCCGAGAT	257LeuLeuAspPheGlnGlnAlaLeu
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3466 TCACAAGCTTTAGAGAGCAGCCTCACAGTCGGAAATGGCTTAACG------ 3510 2914 ---CGGTTAAAGCTCTCCCACGGCCTGACATTTGAAAATGGCGCCGTACGAGCAAAACTA 2970 2971 GGACCAGGACTTGGCACAGACGACTCTGGTCGGTCCGTGGTTCGCACAGGTCGAGGACTT 3030 3412 TCCAAT --- CAAGCCGTTGCTATAAAAGCGGGCGGGGCTTA--- CGCTTTGAGTCTTCC 3465 3625 -------GGCACCGTTAACCCTTCTGCGCCCGAGGCACCACCT 3663 3664 CTCACTGCAGAACCACCCTCCGAGCCTCCAACTCCCATCTTCAACTGTCCCTATCG--- 3720 2875 GCT-----TCCGGAGAGGGTTTAGAAGTCCACAGCGACACCCTC---- 2913 3031 AGAGTTGCAAACGGCCAAGTCCAGGATCTTCAGGGGAAGAGGCACGGCATGGGCACT--- 3087 3187 AACAATGGCACTTTCGGTCTCTCTATAGGCCCCGGAATGTGGGGTAGACCAAAACAGACTT 3246 3307 GATCCGCTGGCTATTTCCGACAGCAAATTAGTCTCAGTCTCGGTCCCGGCCTGACCAA 3366 2815 AATAGGGTGACTGGCCCGCTGGGCCTGAGAATGCTCAACCACCAACTTGCCGTA 2874 3367 GCTTCCAACGCCCTGACTTTAAGT-----TTAGGAAACGGGCTTGAATTC 3411 285 AspArgValProValLysValSerValThr------GluValLysArgHisLysLeu 301 ---GluTyrGlyLeuGlyGly 315 316 LysileAlaTyrAspTyrTyrAsnLeuPheAsn---LysGly---TyrIleGlySerVal 333 334 ValTrpAspMetAspLysTyrGluThrThrLeuAlaAlaGlyIleSerGlnProArgAsn 353 354 TyrArgGlyAsnTyrTrpThrSerAsnValSerTyrAsnArgSerThrThrGlnAsnLeu 373 374 GluLysArgAlaPhe-----SerGlyGlyIleTrpTyrValArgAspArgAla 389 ------LeuAla 401 402 GluGlyArgLysIleProGlySerAspIleAspLeuGly------AsnSer 416 HisalaThrMetLeuThralaSerTrpLysArgGlnLeuLeuAsnAsnValLeuHisPro 436 437 GluAsnGlyHisTyrLeuAspGlyLysIleGlyThrThrLeuGlyThrPheLeuSerSer 456 457 ThralaLeuIleArgThrSeralaArgAlaGlyTyrPhePheThrProGluAsnLysLys 476 477 LeuGlyThrPheIlelleArgGlyGlnAlaGlyTyrThrVal---AlaArgAspAsn--- 494 495 -----AlaAspValProSerGlyLeuMetPheArgSerGlyGlyAlaSerSerValArg 512 531 ------GluArgAlaLeuLeuValGlySerLeuGluTyrGlnLeuProPheThrArg 547 ThrLeuSerGlyAlaValPheHisAsp------560 265 GluGlnAsnGlyHisTyrSerGlyAlaSerValGlnAlaAspPheAspArgLeuGlnGly 284 513 GlyTyrGluLeuAspSerIleGlyLeuAlaGlyProAsnGlySerValLeuPro----561 AlaAlaAsnPheLysArgMetLysLeuLysHisGlySerGlyLeuGlyValArg 578 390 GlyIleAspAlaArgLeuGlyAlaGluPhe---302 GluThrGlyIleArgLeuAspSer----g δ qq qq g οy 요 οy g ò q Qγ a ŏ ద ò õ д ŏ g οy q δ g ò g οy οg ò g δ ò ò

Db 3775 GAAGTAAATCAGCACGGACTTACTTTAAGAGTAGGCTCGGGTTTGCAAATGCGT 3828

Search completed: November 9, 2002, 02:58:46 Job time : 226 secs



Sequence 1, Appli Sequence 4499, Ap Sequence 31, Appli Sequence 21197, Ap Sequence 2130, Ap Sequence 2290, Ap Sequence 2290, Ap Sequence 2362, Ap Sequence 2362, Ap Sequence 232, Ap Sequence 232, Ap Sequence 260, Ap Sequence 28, Appl Sequence 28, Appl Sequence 112, Appl Sequence 1605, Ap Sequence 170, Appl Sequence 170, Appl Sequence 527, Appl Sequence 26, Appl Sequence 34, Appl Sequence 34, Appl Sequence 34, Appl Sequence 35, Appli Sequence 3700, Appli Sequence 3, Appli Sequence 6, Appli Sequence 472, App Sequence 475, App APPLICART: Swanson, Ronald V.
APPLICART: Swanson, Ronald V.
APPLICART: Feldman, Robert A.
APPLICART: Feldman, Robert A.
APPLICART: Schleper, Christa
TITLE OF INVENTION: NUCLEIC ACIDS AND PROPEINS FROM CENARCHAEUM SYMBIOSUM
FILLE REFERENCE: DCORP.002A
CURRENT APPLICATION NUMBER: US/10/027,806
CURRENT FILING DATE: 2001-12-21
PRIOR APPLICATION NUMBER: EARLIER APPLICATION NUMBER: 09/408,020
PRIOR FILING DATE: BARLIER FILING DATE: 1999-09-29
WUMBER OF SEQ ID NOS: 123
SOFTWARE: FASELSEQ for Windows Version 3.0 US-09-790-988-1 US-09-970-988-1 US-09-974-300-472 US-09-974-300-472 US-09-974-300-472 US-09-974-300-472 US-09-871-2197 US-09-871-21197 US-09-864-761-4149 US-09-864-761-21197 US-09-974-300-98 US-09-974-300-2620 US-09-974-300-2620 US-09-974-300-2620 US-09-974-300-2620 US-09-974-300-2620 US-09-974-300-2632 US-09-974-300-2620 US-09-974-300-278-311 US-09-070-9278-311 US-09-070-9278-311 US-09-070-9278-311 US-09-070-9278-311 US-09-070-9278-311 US-09-978-318-260 US-09-978-318-260 US-09-978-318-260 US-09-978-318-260 US-09-978-318-260 US-09-897-056-6 US-09-815-242-4648 US-09-938-842A-2700 US-09-070-927A-504 US-08-973-028-3 Length: Matches: ALIGNMENTS ; Sequence 3, Application US/10027806 ; Patent No. US20020160476Al ; GENERAL INFORMATION: TYPE: DNA ORGANISM: Cenarchaeum symbiosum 9.28e-06 146.00 64 0606 24 0681 24 2681 33 24 39 34 24 39 37 24 39 40 60 9 40 ; LOCATION: (1)...(10419) US-10-027-806-3 LENGTH: 10419 NAME/KEY: CDS Alignment Scores: US-10-027-806-3 122 121.5 112.5 112 112 112 113 110 108.5 108.5 108.5 108.5 108.5 108.5 108.5 108.5 108.5 109.5 SEQ ID NO 3 FEATURE: υ O MODEL-frame+_p20.model -DEV-x1h
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-LOOPCL=0 -LOOPEXT=0 -UNITS=bits -START=1 -END=-1 -MATRIX=blosum62
-TRAMS=human40.cdl -LIST=45 -DOCALLGN=200 -THR_SCORE=pct -TRR_AMX=100
-TARAS=human40.cdl -LIST=45 -DOCALM-ptc - NORM=ext -HEAPSIZE=500 -MINLEN-0
-MAXLEN=2000000000 -USER=USO9857669_eCGN_1_1_21_erunat_05112002_110010_7843
-NCPU-6 -LTCPU-3 -NO_XLDXY -NO_XMAPP -LARGEQUERY -MEC_SCORES=0 -WAIT -LONGLOG
-DEV_TIMEOUT=120 -WAAN_TIMEOUT=30 -THREADS=1 -XARPOP=10 -XGAPEXT=0.5 -FGAPOP=6
-FGAPEXT=7 -YGAPOP=10 -YGAPEXT=0.5 -DELOP=6 -DELEXT=7 Sequence 3, Appli Sequence 2, Appli Sequence 2084, Ap Sequence 4051, Ap Description (without alignments) 3542.038 Million cell updates/sec Pred. No. is the number of results predicted by chance to have a score greater than or equal to the score of the result being printed, and is derived by analysis of the total score distribution.IAYGHSDKKIRWHISLGTRF November 9, 2002, 02:46:30; Search time 61 Seconds / cgn2_6/ptodata/1/pubpna/US07_PUBCOMB.seq:*
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/ cgn2_6/ptodata/1/pubpna/US00_PUBCOMB.seq:* GenCore version 5.1.3 Copyright (c) 1993 - 2002 Compugen Ltd - nucleic search, using frame_plus_p2n model US-10-027-806-3 US-10-027-806-2 US-09-938-842A-2084 0 US-09-815-242-4051 hits satisfying chosen parameters: 320260 segs, 177392727 residues SUMMARIES Post-processing: Minimum Match 0% Maximum Match 100% Listing first 45 summaries Published_Applications_NA:* BLOSUM62 Xgapop 10.0, Xgapext Ygapop 10.0, Ygapext Fgapop 6.0, Fgapext Delop 6.0, Delext 3173 1 MMIKPTALLEPALFFFPHAY. Minimum DB seq length: 0 Maximum DB seq length: 200000000 9999 DB US-09-857-669-2 Query Match Length 10419 42432 1398 2448 Command line parameters: 65... 100... 112...

Database

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Scoring table:

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Feldman, Ronald V.
Feldman, Robert A.
Schleper, Christa
Licarion: Nucleic Acids and PROTEINS FROM CENARCHAEUM SYMBIOSUM
WCE: DCORP.002A
LICARION: NUCLEIC ACIDS AND PROTEINS FROM CENARCHAEUM SYMBIOSUM
MCE: DCORP.002A
STATION NUMBER: US/10/027,806
ING DATE: 2001-12-21
AATION NUMBER: EARLIER APPLICATION NUMBER: 09/408,020
AATION NUMBER: EARLIER FILING DATE: 1999-09-29
SQ ID NOS: 123
SSC for Mindows Version 3.0
                                                                                                                                        CCCCCCTACGACGCATCCACATAACACTGAGTGACAACGGACTGTACAAGGTG 7497
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                                                                                                                                                                                                                                                                                                                                  sTyrLeuAspGlyLysIle------GlyThrThrLeuGlyThrPhe 453
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                                            lArgGlyTyrGluLeuAspSerIleGlyLeuAlaGlyProAsnGlySerValLeu
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HH. Cenarchaeu HH. (3) HH. (3) HH. (3) HH. (10625) HH. (10625) HH. (11478)	Alignment Scores: Predict. No.: Score: 146.00 Matches: 203 Best Local Similarity: 13.17 Best Conservative: 59 Best Local Similarity: 21.33 Mismatches: 203 Best Local Similarity: 21.33 Mismatches: 203 Best Local Similarity: 21.33 Wismatches: 200 Bs: 626.02 (1-609) x US-10-027-806-2 (1-42432) Oy 138 GlyvalalatleLeuGlyAspileLeuSerAspGlyAsnicualaGluTyrTyrArgAsn 157 Db 621 GCACCACCACCCCTGAATCCCTAATARCCCCACACACCCCTGACACCCTTGACACCTT 6320 Oy 158 AlaLeuGluAsnTrpGlnGlpFroValGlySerAspPheAspGlnAspSerTrpGluAsn 177 Db 6321 GTATGGAC

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RESULT 3 US-09-938-842A-2084 Sequence 2084, Application US/09938842A	Qy	253AspLeuAspLeuLeu
PACENT NO. USJUGUS/BAI GENERAL INFORMATION: APPLICANT: Horper, Jeff APPLICANT: Kreps, Joel	Qy	258
APPLICANT: Wang, XUN APPLICANT: Zhu, TON TITLE OF INVENTION: STRESS-REGULATED GENES OF PLANTS, TRANSGENIC PLANTS CONTAINING TITLE OF INVENTION: SAME, AND METHODS OF USE	Qy Db	274 ServalGinalaAspPheAspArgLeuGinGlyAspArgValProVal
NT APPLICATION NT FILING DATE APPLICATION	Qy	290 LysValSerValThrGluValLysArgHisLysLeuGluThrGlyIleArgLeu 307 ::: ::: ::: ::: ::: :::
PRION FILING DATE: 2000-08-24 PRION APPLICATION NUMBER: 2001-01-16 PRIOR FILING DATE: 2001-01-16 PRIOR APPLICATION NUMBER: US 60/300,111	Qy Dp	308 AspSerGluTyrGlyLeuGlyGlyLysIleAlaTyrAspTyrTyrAsnLeuPheAsnLys 327 :::
~~~~ <u>~</u>	Qy Db	328 GlyTyrIleGlySerValValTrpAspMetAspLysTyrGluThrThrLeuAlaAlaGly 347 :::
	Qy	348 IleSerGlnProArgAsnTyrArgGlyAsnTyrTrpThrSerAsnValSerTyrAsnArg 367 :::
Pred. No.: 3.16e-05 Length: 1398 Score: 129.50 Matches: 121 Score: 35.50% Conservative: 54	Oy Db	368 SerthrthrGlnAsnLeuGluLysArgAlaPheSerGlyGlyIleTrpTyrValArgAsp 387 
: 24.04% MISMACCHES: 4.08% Indels: 9 Gaps: 9 VIG-00-038-84.08-7084 /1-1308	Qy Db	388 ArgalaGlyileAspAlaargLeuGlyAlaGluPheLeuAlaGluGlyArgLysIlePro 407 
96 ProAspAsnValLysThrMetLeuArgSerLysGl) 1	Q,	408 Glyserasp-ileaspLeuGlyasnSerHisalaThrMetLeuThrala
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TyrargasnalaLeugluasnTrpGlnGlnProValGlySerasp  AngrangasnalaLeugluasnTrpGlnGlnProVal	Oy Db	462 rSerAlaArgAlaGlyTyrPhePheThrProGluAsnLysLysLeuGlyThrPh 480 
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APPLICANT: Oblisen, Kari L.
APPLICANT: Zyskind, Judith W.
APPLICANT: Wall, Daniel
APPLICANT: Wall, Daniel
APPLICANT: Carr, Grant J.
APPLICANT: Carr, Grant J.
APPLICANT: Yanamoto, Robert T.
APPLICANT: WUMBER: US/09/815,242
CURRENT APPLICATION: Prokaryotes
FILE REFRENCE: ELITRA.011A
CURRENT APPLICATION: NUMBER: 60/206,848
PRIOR FILING DATE: 2000-03-21
PRIOR FILING DATE: 2000-05-23
PRIOR APPLICATION: NUMBER: 60/206,727
PRIOR APPLICATION: NUMBER: 60/207,727
PRIOR APPLICATION: NUMBER: 60/253,625
PRIOR APPLICATION: NUMBER: 60/253,625
PRIOR FILING DATE: 2000-11-27
PRIOR PRILING DATE: 2000-11-27
PRIOR PRILING DATE: 2000-12-22
PRIOR FILING DATE: 2000-12-22
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NUMBER OF SEQ 1D NOS: 14110
SOFTWARE: FastSEQ for Windows Version 4.0
SEQ 1D NO 4051
                                                                    Sequence 4051, Application US/09815242
Patent No. US20020061569A1
GENERAL INFORMATION:
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US-09-815-242-4051
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892 AGGGCCCCACTGACCGAGTCCGGCAACGTCCGGGCGGCGGTAGCCGCCTACCAGGAT 951
nAlaLeuGluAsnTrpGlnGlnProValGlySerAspPheAspGlnAspSerTrpGluAs 177
                                    -GCCATGTCGAACTGGGGCGGGGCAGTTGGGACA---ATTACCGCTCCGAACTGGACGTC
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APPLICANT: VAN GERL-SCHUTTEN, GERRITDINA HENDRIKA
APPLICANT: BARAOUI, HAKIM
APPLICANT: LEER, ROBERT-JAN
TITLE OF INVENTION: NOVEL GLUCOSYLTRANSFERASES
FILE REFERENCE: B043388-CIP
CURRENT APPLICATION NUMBER: 09/604,957
PRIOR FILING DATE: 2001-11-29
PRIOR APPLICATION NUMBER: CP0/604,957
PRIOR FILING DATE: 2000-06-28
PRIOR FILING DATE: 2000-06-28
PRIOR FILING DATE: 2000-06-28
SOFTWARE: PALECATION NUMBER: EP0 002018/1.1
SEQ ID NO.
SEQ ID NO.
LENGTH: 6026
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Matches:
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3854 AAGTATGTTGCCGGTGGCCAATCAATGCAAACAATGAGCGTTGGCGGCAATAATAACATT 3913
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                                    3485 TCATTAGCTGATCGTGAAAATAATTCCACGGAAAATGTTGTAATT---CCTAATTACAGT 3541
                                                                                                                                                                                           ------CGTGATGTAACAGGCAAAGATTACCATACTTTCACTTTTGAAGAT 3637
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                                                                           55 ValArgileAspThrGlnAspSerGluIleLysAspMetValGluGluHisLeuProLeu 74
                                                                                                                                                      75 IleThrGlnGlnGlnGluGluValLeuAspLysGluGlnThrGlyPheLeuAlaGluGlu 94
35 AlaLeuPheLysAsnLysSerProAspThrGluSerValLysLeuLysProLysPhePro 54
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qa	
6 6 6	324 LeuPheAsnLysGlyTyrIleGlySerValValTrpAspMetAspLys 339
ογ	m
qq	4586 TATGATCTTGGAATGAGTGAGCCTAATAAGTACGGAACAGATGAGAT 4633
οy	359TrpThr 360
qq	4634 CTACGTAATGCCATTCAAGCGCTCCATAAAGCTGGCTTACAAGTAATGGCGGATTGGGTT 4693
QY	361 SerAsnValSerTyrAsnArgSerThrThrGlnAsnLeuGluLys 375
qq	4694 CCTGACCAAATCTATAACCTTCCTGGAAAAGAAGTTGCTACAGTCACTCGAGTAGATGAT 4753
à á	376 ArgalaPheSerGlyGlyIleTrpTyrValArg 386  11
3 2	ACDATOR   PACT   VALUE   VALUE
. a	AATACTATIGGIGGCGAATACCAGAAGAAGTATGGIGGAGCATICCTCGGATAAGTTA
ογ	404 ArgLys1le
9	4865 CAAAAACTTTATCCTGAAATCTTCACAAAGAAGCAAGTTTCAACTGGTGTTGCTATTGAT 4924
ογ	413 LeuGlyAsnSerHisAlaThrMetLeuThrAlaSerTrpLysArgGlnLeuLeuAsn 431
QQ	4925
ò :	432AsnValLeuHisProGluAsnGlyHisTyrLeuAspGly 444
9	
λō	LysileGlyThrThrLeuGlyThrPheLeuSer
2	5030 AACTTAGGTACTACTACAAAGCAATTCTTGCCAATTCAATTAACTGGTGAAAAGAAACAA 5089
ογ	455 455
g	5090 GGAAAIGAAGGCITICITAAAGGGIAAIGATGGAAATTACTACTTCTAIGACTIAGCAGGI 5149
δy	456SerThralaLeulleArgThrSerAlaArgAlaGlyTyrPhePheThrPro 472
qg.	AATATGGTTAAGAATACCTTTATTGAAGATAGTGTTGGCAACTGGTACTTCTTTGACCAA
දු දු	473 Gluasniysiysi.eu
۵y	479 ThrPheileileargGlyGlnalaGlyTyrThrValAlaArgAspAsnAlaAspValPro 498
Q	5270 ACTTACTTCTTCTTGAAG 5287
ολ	499 SerGlyLeuMetPheArgSerGlyGlyAlaSerSerValArgGlyTyrGluLeuAsp 517
QQ	5288 AATGGTGTATCATTCCGTGGGGGATTAGTGCCAAACTGACAATGGTACTTATTACTTTGAT 5347
÷ 5	518 SerlieGlyLeuAlaGlyProAsnGlySerValLeuProGluArgAlaLeuLeuValGly 537
ò	SerLeuGluTyrGlnLeu 543
an 1	5350 GCCATGATTATACCTTA 540/
NESC US-0	KESULI 0 US-09-790-988-1

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261854 TATAATCCAGACAAAATTGATATTATAGTAAATAAATAACAAGATTTTATCTGAATAT 261913
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Db 261698 AAAGTAGATTTTTGCAAGATAAAAAACAGGTGGATATCACAATAGGTGTTTTTGTGAAGGA 261757
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Db 262019 AGAATTTATTTTACAGGGAATGAAATAACTCAAGATAGAGTTTTACGTCGTAAAATTAAA 262078
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    130 ProArgThrLysIleAlaAsnValGlyValAlaIleLeuGlyAspIleLeuSerAspGly 149
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              170 PheAspGlnAspSerTrpGluAsnSerLysThrSerValLeuGlyAlaValThrArgLys 189
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Qy 150 AsnLeuAlaGluTyrTyrArgAsnAlaLeuGluAsnTrpGlnGlnProValGlySerAsp 169
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         207 --- ThrAlaThrValAspLeuAsnValValValValAspSerGlyArgProIleAlaPheGly 225
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   266 GlnAsnGlyHisTyrSerGlyAlaSerValGlnAlaAspPheAspArgLeuGlnGlyAsp 285
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Sequence 1, Application US/09790988
Patent No. US20020127687A1
GENERAL INFORMATION:
APPLICANT: SHIGENOBU SHUJI
APPLICANT: WATANABE, HIDEMI
APPLICANT: HATTORI, MASAHIRA
APPLICANT: GENOME DNA OF BACTERIAL SYMBIONT OF APHIDS
TITLE OF INVENTION: GENOME DNA OF BACTERIAL SYMBIONT OF APHIDS
FILE REPERENCE: 081356/0159
CURRENT FALING DATE: 2001-02-3
PRIOR FILING DATE: 2001-04-07
NUMBER OF SEQ ID NOS: 1
SCHWARE FELING DATE: 2000-04-07
SCHWARE FELING DATE: 2000-04-07
SCHWARE PELING DATE: 2000-04-07
SCHWARE PELING DATE: 2000-04-07
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Mismatches:
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37.62%
18.18%
3.83%
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; ORGANISM: Buchnera sp.
US-09-790-988-1
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Best Local Similarity:
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LENGTH: 640681
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Best Local Similarity: 18.50% Mismatches: 226 Query Match: 3.66% Indels: 268 DB: 10 Gaps: 29 US-09-857-669-2 (1-609) x US-09-886-468-6 (1-2950)	Oy 108 TyrPheSerSerLysValSerLeuThrGluLysAspGlyAlaTyrThrValH1sIleThr 127	Qy 128 ProGlyProArgThrLysIleAlaAsnValGlyValAlaIleLeuGlyAspIleLeuSer 147	Oy 148 AspGlyAsnLeuAlaGlu159	Qy 160161uAsnTrpGlnGlnProValGly167 :::	Qy 168SerAspPheAspGlnAspSerTrpGluAsnSerLysThrSer 181	Qy 182 ValleuGlyAlaValThrArgLysGlyTyrProLeu	Oy 194	Qy 207 ThralaThrValAspLeuAsnValValValAspSerGlyArgProIleAlaPheGlyAsp 226	Qy 227 PheGluIleThrGlyThrGlnArgTyrProGluGlnIleValSerGlyLeuAlaArgPhe 246	Qy 247 GlnProGlyThrProTyrAspLeuAspLeuLeuAspPheGlnGlnAlaLeuGluGln 266	Qy 267 AsnGlyHlsTyrSerGlyAlaSerValGlnAlaAspPheAspArgLeuGlnGly 284	Qy 285 AspargvalProvalLysvalServalThrGluValLysArgHisLysLeuGluThrGly 304	Oy 305 IleargLeuaspSerGluTyrGlyLeuGlyGlyLysIlealaTyrasp 320   11	Oy 320 320	1100 ATCAGTTTATCAGCAGAGAAAGGAACAATTACATTCCAAGGAAACCGGACGAGGTTACCG	Db 1160 TTTTGAATGGGATCCATCTTTTACAAAATGCTAAATTCCTGAAATTACAGGGGAGAAAT 1219	321TyrTyrAsnLeuPhe	Db 1220 GGATACTCTATAGAATTTTATGATCCTATTACTTCTGAAGCAGATGGGTCTACCCAATTG 1279  Qy 326
Db 262199 CAAATTGATATACCTATCAAGTTAAAGAACAGACTACTGGTTCTATAAATTTGGTTTA 262258  Qy 306 ArgLeuAspSerGluTyrGlyLeuGlyGlyLysIlealaTyrAspTyrTyrAsnLeuPhe 325  Db 262259 GGATATGGAGTAGTGGTACCAGTTTTAATCTTGCTTTTTCTCAAGATAATATTT 262318	<pre>Qy 326 AsnLysGlyTyrIleGlySerValValTrpAspMetAspLysTyrGluThrThr 343</pre>	Oy 344 LeualaalaGlyIleSerGlnProArgAsnTyrargGlyAsn	Qy 358 TyrTrpThrSerAsnValSerTyrAsnArgSerThrThrGlnAsnLeuGluLysArgAla 377	Qy 378 PheSerGlyGlyIleTrpTyrValArgAspArgAlaGlyIleAspAlaArgLeuGly 396         ::           ::   Db 262493 TAT	RESULT 7 US-09-886-468-6 ; Sequence 6, Application US/09886468	gens and corresponding DNA fragments and uses	REFERENCE: //B NT APPLICATION NT FILING DATE APPLICATION N	APPLICATION N FILING DATE: APPLICATION N	FILING DATE: APPLICATION N FILING DATE: APPLICATION N	FRIOR FILING DATE: 1990-112-23 FRIOR FILING DATE: 1998-12-23 FRIOR FILING DATE: 1008-13-385 FRIOR APPLICATION NUMBER: 60/113,385		; PRIOR FILING DATE: 1998-12-28 ; PRIOR APPLICATION NUMBER: 60/114,057 ; PRIOR PLLING DATE: 1998-12-28 ; PRIOR APPLICATION NUMBER: 60/114,058	FILING DATE: 1998-12-2 APPLICATION NUMBER: 60 FILING DATE: 1998-12-2 APPLICATION NUMBER: 60	FILING DATE: 1998-12-28  NUMBER OF SEQ ID NOS: 26  ORTHURDED: DATE: VAR 2 0	6 2950	α,	; NAME/KEY: CDS ; LOCATION: (101)(2866) US-09-886-468-6	Alignment Scores: 0.00341 Length: 2950 Pred. No.: 0.00341 Matches: 131 Score: 116.00 Matches: 131

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PistyrGluthrThrLeuAlaAlaGlyIleSerGlnProArgAsnTyrArgGlyAsnTyr 338  Add———AGTTGACA—————————————————————————————
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1182 GAC------GAGCTCGCAGAAAGGGGC 1202
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          139 ValAlaIleLeuGlyAspIleLeuSerAspGlyAsnLeuAlaGlu-----TyrTyr 155
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              156 ArgasnalaLeuGluasnTrpGln-----GlnProValGlySerAspPheAspGlnAsp 173
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      AsnLysSerProAspThrGluSerValLysLeuLysProLysPheProValArgIleAsp 58
                                                                                                                             US-00-974-300-472
US-00-974-300-472
US-00-974-300-472
US-00-974-300
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Matches:
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1026 AACAACAATCCTGAGACGGTTTCAACA------
                                        2321 GGTCATGCCACCAATGATAAA 2344
593 GlyHisSerAspLysLysIleArg 600
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; ORGANISM: Bacillus licheniformis
US-09-974-300-472
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112.00
35.11%
21.88%
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191 356	TyrProLeuAla         ::   TyrccGGTGCTTGTCCGCCATC
206 ASPT 416 CATG	ASPThralathrValaspLeuasnValValValaspSerGlyargPro 221     :::::     :::::
222 IleA ::: 476 GTCC	IlealaPheGlyAspPheGluleThrGlyThrGlnargTyrProGluGlnIleValSer 241 :::      :::       ::: GTCTGATCGATAAATATTTGACCGGAAAAGAATAGAAGTGGATGCCATTTCTGAC 1532
242 GlyI      533 GGTC	GlybeualaargPheGlnProGlyThrProTyrAspbeuAspbeuLeuLeuAspPheGln 261 
262 Gln ::: 563 GAG	GinalaLeuGluGlnasnGlyHisTyrSerGlyAlaSerValGlnalaAspPheAspArg 281 ::: :::   :::     :::
282 Leu 1605	LeuGlnGlyAspArgValProValLysValSerValThrGluValLysArgHisLysLeu 301 
302 Glu      653 GAJ	GluThrGlyIleargLeuaspSerGluTyrGlyLeuGlyGlyLysIlealaTyrasp 320 
321 TY :: 713 TT	TyrTyrAsnLeuPheAsnLysGlyTyrIleGlySerValValTrpAspMetAspLysTyr 340 :::
341 G1 752	GluThrThrLeuAlaAlaGlyIleSerGlnPrOArgAsnTyrArgGlyAsnTyrTrpThr 360        :::     ::: 
361 Se         1785 AG	SerasnValSer TyrasnargSerThr
370 845 CT	
384 TY    1896 TA	TyrValArg
397 A1 1956 CC	AlagluPheLeuAlagluGlyArgLysIleProGlySerAsp
411 2013 CT	
422 Th	ThralaSerTrpLysArgGlnLeuLeuAsnAsnValLeuHisProGluAsnGlyHisTyr 441 
442 Le 2130 AT	LeuAspGlyLysIleClyThrTherGlyThrPheLeuSerSerThrAlaLeu 459 ::: :::::::::::::::::::::::::::::::::
460	IleArgThrSerAlaArgAlaGlyTyrPhePheThrProGluAsnLysLysLeuGly 478 
38 GAT	GTCATTCGAAACGGGGGGGGGGGGTTCGTCGTCAATACGCTGACAAAAGGGAAGCAG 2297

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1930 GAC-----GAGCTCGCAGAAAGGGGC 1950
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       ArgAsnAlaLeuGluAsnTrpGln-----GlnProValGlySerAspPheAspGlnAsp 173
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             99 ValLysThrMetLeuArgSerLysGlyTyrPheSerSerLysValSerLeuThrGluLys 118
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                119 AspGlyAlaTyrThrValHisIleThrProGlyProArgThrLysIleAlaAsnValGly 138
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     139 ValalaileLeuGlyAspileLeuSerAspGlyAsnLeuAlaGlu*******TyrTyr 155
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          174 SerTrpGluAsnSerLysThrSerValLeuGlyAlaVal-----ThrArgLysGly 190
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              20 TyralaProAlaAlaAspLeuSerGluAsnLysAlaAlaGlyPhe---AlaLeuPheLys 38
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      59 ThrGlnAspSerGluIleLysAspMetValGluGluHisLeuProLeuIleThrGlnGln 78
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       79 GlnGluGluValLeuAspLysGluGlnThrGlyPheLeuAlaGluGluAlaProAspAsn 98
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   39 AsnLysSerProAspThrGluSerValLysLeuLysProLysPheProValArgIleAsp 58
                                                                                                                                                APPLICANT: Berka, Randy M.
APPLICANT: Clausen, 1b Groth
TITLE OF INVENTION: Methods For Monitoring Multiple Gene
TITLE OF INVENTION: Methods For Monitoring Multiple Gene
TITLE OF INVENTION: Wethods For Monitoring Multiple Gene
FILE REFERENCE: 10085.500-US
CURRENT APPLICATION WUMBER: US/09/974,300
CURRENT FILING DATE: 2001-10-05
PRIOR FILING DATE: 2001-0-06
PRIOR FILING DATE: 2001-0-06
PRIOR FILING DATE: 2001-0-06
PRIOR FILING DATE: 2001-0-06
SPRIOR FILING DATE: 2001-0-06
SOFTWARE: FastsEQ for Windows Version 4.0
SSOFTWARE: FastsEQ for Windows Version 4.0
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       3213
119
72
187
166
29
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Matches:
Conservative:
Mismatches:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              US-09-857-669-2 (1-609) x US-09-974-300-475 (1-3213)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Indels:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Gaps:
                                                                                   US-09-974-300-475
; Sequence 475. Application US/09974300
; Patent No. US20020146721A1
; GENERAL INFORMATION:
                                                                                                                                                                                                                                                                                                                                                                                                                    TYPE: DNA ORGANISM: Bacillus licheniformis
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       0.0111
112.00
35.11%
21.88%
3.53%
                   11111111
2298 CCGGCAAGGGAC 2309
491 --- AlaArgAsp 493
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Best Local Similarity:
                                                                                                                                                                                                                                                                                                                                                                                                                                           ; ORGANISM: Bac
US-09-974-300-475
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Alignment Scores:
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US-09-857-669-2 (1-609) x US-09-332-226-1 (1-3286)
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APPLICATION NUMBER:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       CDS
406..3150
                   3046 CCGCCAAGGGAC 3057
                                                                                                                                                                                                                                                                                                                                                                                                                                                                 APPLICATION NUMBER:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                nucleic acid
491 ---AlaArgAsp 493
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     TOPOLOGY: linear
MOLECULE TYPE: CDNA
                                                                                                                                                                                                                                                                                          CITY: New York
STATE: New York
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Percent Similarity:
Best Local Similarity:
Query Match:
                                                                                                                                   GENERAL INFORMATION
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 CLASSIFICATION:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              STRANDEDNESS:
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                                                                                                                                                                                                                                                                                                                            USA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     STRAIN: FA19
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     FILING DATE:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   ANTI-SENSE: NO
FRAGMENT TYPE:
                                                                                                                                                                                                                                                                                                                                          10014
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   FILING DATE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     ORGANISM:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       NAME/KEY:
LOCATION:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Alignment Scores:
                                                                                                                                                                                                                                                                                                                            COUNTRY:
                                                                                 US-09-332-226-1
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        US-09-332-226-1
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                                                                     RESULT 10
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                                                                                                        --------GCCGTTTACCCGCCGCAATCCCTTTCAGAGGACATCAAGAAAAAGCTT 2400
                                                                                                                                                                                                                                                                                                                                                                                                                                                   2533 AGCAAAATCACCGGCATTCCGATGGCCAATCTCGCAACAAAGGTGATTCTCGGAGGGAAG 2592
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       2593 CTTGCCGATATGGGCTATACAGAAGGCCTCCAAAAAGAG------CAGGAAGGCGTA--- 2643
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          2644 TATGTGAAAGTGCCGGTCTTCTCGTTTGCGAAGCTTAGAAGAGGTGGATATCACGCTCGGA 2703
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 2704 CCGGAAATGAAATCGACCGGG---GAAGTCATGGGCAAAGGACAGCACATTGGAAAAGCG 2760
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   CCTGTTAAAACCGTCGGGAAAATCGGC------GAAGAAGGTACAAATCTCCTT 2985
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2986 GATGTCATTCGAAACGGGGAGGCGCAGTTCGTCGATACGCTGACAAAAGGGAAGCAG 3045
                                                                                                                                                                                     2224 GTCCTGATC---GATAAATATTTGACCGGAAAAGAAATAGAAGTGGATGCCATTTCTGAC 2280
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   2821 ACAGTTGCTGATAAAGATAAA---GAGGAAGGCTGTTGATCGCCAAGCGGTTCCATGCG 2877
                                                2104 TATCCGGTGCTTGTCCGCCCATCGTATGTACTCGGCGGACGTGCGATGGAGATCGTCTAC 2163
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 321 TyrTyrAsnLeuPheAsnLysGlyTyrIleGlySerValValTrpAspMetAspLysTyr 340
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        370 ------ThrGlnAsnLeuGluLysArgAlaPheSerGlyGlyIleTrp 383
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        460 --- IleArgThrSerAlaArgAlaGlyTyrPhePheThrProGluAsnLysLysLeuGly 478
                                                                                                                                                                                                                                                                                                                                                                                                                              302 GluThr --- GlyIleArgLeuAspSerGluTyrGlyLeuGlyGlyLysIleAlaTyrAsp 320
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                -----LysLeuGlyAsnThrArgAlaAlaValAsnPro 205
                                                                                 206 AspThrAlaThr------ValAspLeuAsnValValValAspSerGlyArgPro 221
                                                                                                                                                   222 IlealaPheGlyAspPheGluIleThrGlyThrGlnArgTyrProGluGlnIleValSer 241
                                                                                                                                                                                                                                                                                        262 GlnAlaLeuGluGlnAsnGlyHisTyrSerGlyAlaSerValGlnAlaAspPheAspArg 281
                                                                                                                                                                                                                                                                                                                                                          282 LeuGlnGlyAspArgValProValLysValSerValThrGluValLysArgHisLysLeu 301
                                                                                                                                                                                                                     GlyLeuAlaArgPheGlnProGlyThrProTyrAspLeuAspLeuLeuLeuAspPheGln 261
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        SerAsnValSer-----TyrAsnArgSerThr--
                                                                                                                                                                                                                                                     2281 GGTGAAACGGTCGTCATTCCGGGG------
          TyrProLeuAla-----
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APPLICANT: Sparling, P. Frederick
APPLICANT: Cornelissen, Cynthia N.
TITLE OF INVENTION: Transferrin-Binding Proteins From
TITLE OF INVENTION: Neisseria Gonorrhea and Neisseria Meningitidis
NUMBER OF SEQUENCES: 8
CORRESPONDENCE ADDRESS:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       3286
150
89
281
181
36
                                                                                                                                                                                                                                                                                                   COMPUTER READABLE FORM:
MEDIUM TYPE: Floppy disk
MEDIUM TYPE: TBM PC COMPATIBLE
OPPRATING SYSTEM: PC-DOS/MS-DOS
SOFTWARE: Patentin Release #1.0, Version #1.25
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Length:
Matches:
Conservative:
Mismatches:
Indels:
                                                                                                                                                                                  ADDRESSEE: Imclone Systems Incorporated
STREET: 180 Varick Street
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  PRIOR APPLICATION DATA:

APPLICATION NUMBER: US 07/973,336
FILING DATE: 05-NOV-1992
PRIOR APPLICATION DATA:
APPLICATION NUMBER: US 07/572,187
FILING DATE: 23-A0G-1990
ATTORNEY AGENT INFORMATION:
NAME: Gallagher, Thomas C.
REGISTRATION UNMBER: 37,066
REFERENCE/DOCKET NUMBER: SPA-1-PDC
TELECOMMUNICATION INFORMATION:
TELEPAN: (212) 645-2054
INFORMATION FOR SEQ ID NO: 1:
SEQUENCE CHARACTERISTICS:
                                                                                                                                                                                                                                                                                                                                                                                                                                   US/09/332, 226
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Neisseria gonorrheae
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  08/363,124
Sequence 1, Application US/09332226 Patent No. US20020025318A1
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    LENGTH: 3286 base pairs
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 N-terminal
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34.09%
21.40%
3.53%
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δ	9	ThralaLeuLeuLeuFroAlaLeuPhePhePheProHisAlaTyrAlaProAlaAsab	25
QQ	411	ACAGCAACATTTGTTCCGATTAAATATTTTATGCCTGTCTTTAATGACTGCGTGCCCGC	470
oy og	26	Leu-SerGluasnLysalaalaPhealaLeuPheLysasnLysSerProAspThrGl	45 524
ò	45	a)	65
Ωp	525	ACAGGTAAAAAGCCAAAAAACAGAAAACCGGCGGCGATAACGAAGTAAC	572
ò	65	sAspMetValGluGluHisLeuProLeuIleThrGlnGlnGlnGluGluValLeuAsp	84
Q	573	CGGTTTGGGCAAATTGGTCAAAACCGCCGACACTCAGCAAGGAACAGGTACTCGACAT	632
ò	85		100
q	633	CCGCGACCTGACGCGTTACGACCCCGCCGTCGTCGAACAGGGGCGCGGCGCAAG	692
ò	100	<pre>sThrMetLeuArgSerLysGlyTyrPheSerSerLysValSerLeuThrGluLysAspGl :::  </pre>	120
qq	693	CTCGGGCTACTCGATACGCGGTATGGACAAAAACCGCGTCTCCTTGACGGTGGACGG	749
Oy Dp	120	yAlaTyrThrValHisileThrProGlyProArgThrLysileAl	135 806
ò	135	aAsnValGlyValAlaIle	146
qq	807		998
δ	146	uSerAspGlyAsnLeuAlaGluTyrTyrArgAsnAlaLeuGluAsnTrpGl	163
gg	867	CAAAGGCTCAAACTCGGTCGAACAAGGCAGCGGCGCATTGGCGGGGTCGGTC	926
oy oy	163 927	nGlnProvalGlySerAspPheAspGlnAspSerTrpGluAsnSerLysTh	180 986
ογ	180	rSerValLeuGlyAlaValThrArgLysGlyTyrProLeuAlaLysLeuGl	197
qq	987	CGCCTATTCCGGCAAAAACCGGGGGCTTACCCAATCCATCGCGCTGGCGGGGGGGCGTTGGG	1046
٥y	197	yAsnThrArgAlaAlaValAsnPrOAspThrAlaThrValAspLeuAsnValValValAs	217
qq	1047	CGGTGCGGAGGCTTTGCTGATCCG	1070
οy	217	pSerGlyArgProlleAlaPheGlyAspPheGluIleThrGlyThrGlnArgTyrProGl	237
g	1071	CACCGGCCGCACGCGGGGGAAATCCGCGCCCACGAAGCCGCCGGACGCGGCGT	1124
ò	237	uGlnIleValSerGlyLeuAlaArgPheGlnProGlyThrProTyrAspLeuAspLeuLe	257
qq	1125	TCAGAGCTTCAACAGGCTGGCGCCGGTTGATGACGGCAGCAAGTACGCCTATTTCATCGT	1184
δý	257	uLeuAspPheGlnGlnAlaLeuGluGlnAsnGlyHisTyrSerGlyAlaSerValGlnAl	277
g	1185	TGAAGAAGAATGCAAAAACGGGGGTCAC	1212
ò	277	aAspPheAspArgLeuGlnGlyAspArgValProValLysValSerValThrGluValLy	297
qq	1213	GAAAAGTGTAAAGCGAATCCGAAAAAAGATGTTGTCGCGGAAGACAA	1259
οy	297	SArgHisLysLeuGluThrGlyIleArgLeuAspSerGluTyrGlyLeuGlyGlyLysIl	317
g	1260	ACGTCAAACGGTTTCCACCCGAGACTACACGGGCCCCAACCGCTTCCTCGCCGATCCGCT	1319
ογ	317	eAlaTyrAspTyrTyrAsnLeuPheAsnLysGly	328
g	1320	Ō	1379

ò f	329	-TyrileGlySerValValTrpAspMetAspLysTyrGluThrThrLe 344           ::::          TyaCarCGCGCATACTCCAACCAACAAAATTTTCAACAACGCGGAAAAGAGGGGGGAAAAGAAGGGGGGAAAAGAAAAAA
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oy B	344	uAladladlyllaser
δy	355	pThrSerAsnValSerTyrAsnArgSerThrThrGlnAsnLe
Q	1500	Ö
οy	374	uLysArgala
qq	1557	AAACAATGCGCCGGTGGGCGCGGAATACGGTACGGGCGTGTTTTACGACGAGAC 1610
ò	389	aGlyIleAspAlaArgLeuGlyAlaGluPheLeuAlaGluGLyArgLysIleProGlySe 409
qq	1611	GCACACCAAAAGCCGCTACGGTTTGGAATATGTCTATACCAATGC 1655
ολ	409	rAspileAspLeuGlyAsnSerHisAlaThrMetLeuThrAlaSerTrpLySArgGlnLe 429
a	1656	CGATAAAGACACTTGGGGGGATTATGCCGGCTCTCTTACGACCGGCAG 1704
ολ	429	LeuAsnAsnValLeuHisProGlu
qq	1705	GCCATCGGTTTGGACATCATTTCAGCAGAC 1736
ογ	449	rLeuGlyThrPheLeuSerSerThrAlaLeulleArgThrSerAlaArgAlaGlyTyrPh 469
qq	1737	GCACTGTTCCGCCGACGGTTCGCGACAATATTGCCGTCCGAGTGCCGACAAGCCGTTTTC 1796
δ	469	ePheThrProGluAsnLysLysLeuGlyThrPheIleIleArgGly
qq	1797	CTATTACAAATCCGACCGCGTGATTTACGGGGAAAGCCATAAGCT 1841
ò	485	GlnAlaGlyTyrThrValAlaArgAspAsnAlaAspValProSerGlyLeuMetPh 503
g	1842	CTTGCAGGCGGCATTCAAAAAATCCTTCGATACCGCCAAAATCCGCCACAACCTGAGCGT 1901
ò	503	eArgSerGlySlyAlaSe 509
QQ	1902	Ü
οy	509	rSerValArgGlyTyrGluLeuAsp517
qq	1962	TGCCAACCGCGCCTATTCGTTGAAAACGCCCCCTCAAAACAACGGCAAAAAAACAGCCC 2021
٥y	518	SerlieGlyLeuAlaGlyProAsnGlySe 527
QQ	2022	CAACGGCAGAGAAAAGAATCCCTATTGGGTCAGCATAGGCAGGGGAAA 2069
ογ	527	rValLeuProGluArgAlaLeuLeuValGlySerLeuGluTyrGlnLeuProPheThrAr 547
q	2070	TGTCGTTACGAGGCAAATCTGCCTCTTTGGCAACAATACTTATACGGACTGCACGCCGGG 2129
δy	547	aAlaAsn
q	2130	CAGCATCAACGGCAAAAGCTATTACGC 2156
ογ	567	tLysLeuLysHisGlySerGlyLeuGlyValArgTrpPheSerProLeuAlaProPheSe 587
QQ	2157	rccarragacAgaragaca
ò	587	rPheAsplleAlaTyrGlyHisSerAspLysLyslleArgTrpHisIleSerLeuGlyTh 607
qq	2214	
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                                 APPLICANT: TIMES, Suresh
APPLICANT: Thang, Linong
APPLICANT: Babluk, Lorne
APPLICANT: Shang, Linong
APPLICANT: Wall All And Andrew
TITLE OF INVENTION: MODIFIED BOVINE ADENOVIRUS HAVING
TITLE OF INVENTION: ALTERED TROPISM
FILE REFERENCE: 293102003000
CURRENT APPLICATION NUMBER: US/09/871,212
CURRENT APPLICATION NUMBER: 60/208,678
PRIOR FILING DATE: 2000-05-31
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Matches:
Conservative:
Mismatches:
Indels:
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SOFTWARE: FastSEQ for Windows Version 4.0
SEQ ID NO 1
Sequence 1, Application US/09871212 Patent No. US20020034519A1 GENERAL INFORMATION:
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Best Local Similarity:
Query Match:
DB:
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186 ValThrArgLysGlyTyrProLeuAlaLysLeuGlyAsnThrArgAlaAlaValAsnPro 205
                                                                                                                                                                                                                                                                                                                                 226 AspPheGluIleThrGlyThrGlnArgTyrProGluGlnIleValSerGlyLeuAlaArg
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           .....ThrGlyPheLeuAlaGluGluAlaProAspAsnValLysThr 101
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                                                                         N: MAP TO AC005366.1

N: EXPRESSED IN BT774, SIGNAL = 1.2

N: EXPRESSED IN BRAIN, SIGNAL = 4.3

N: EXPRESSED IN HBLIOO, SIGNAL = 3.5

N: EXPRESSED IN HBLIO, SIGNAL = 1.2

N: EXPRESSED IN PLACENTA, SIGNAL = 2.2

N: EXPRESSED IN PLACENTA, SIGNAL = 1.4

N: EXPRESSED IN PEATL LIVER, SIGNAL = 1.4

N: EXPRESSED IN FETAL LIVER, SIGNAL = 1.7

N: EXPRESSED IN FETAL LIVER, SIGNAL = 1.7
                                                                                                                                                                                                                                                                                                                                                                                                                                     Matches:
Conservative:
Mismatches:
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                                                                                                                                                                                                                                                                                                                                                                                                              Length:
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                                                                                                                                                                                                                                                                                                                                                                                                           0.013
108.50
30.84%
19.82%
     TYPE: DNA
ORGANISM: Homo sapiens
FEATURE:
                                                                      OTHER INFORMATION: M. OTHER INFORMATION: E. OTHER INFORMATION: E.
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Best Local Similarity:
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DB:
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Patent No. US20020048763A1
GENERAL INFORMATION:
APPLICANT: Penn, Sharron G.
APPLICANT: Rank, David R.
APPLICANT: Rank, David R.
APPLICANT: Chen, Wensheng
TITLE OF INVENTION: HUMAN GENOME-DERIVED SINGLE EXON NUCLEIC ACID PROBES USEFUL FOR
                                                                                                                                                                                                                                                                                                               29692
                                                                                                                                                                          -----GluArgAlaLeuLeuValGlySerLeuGluTyrGlnLeuProPheThrArg 547
                                                                                                                        29696 CTCACTGCAGAACCACCCCTCCGAGCCTCCAACTCCCCATCTTCAACTGTCCCTATCG---
                                                                                                                                                                                                                                                                             513 GlyTyrGluLeuAspSerIleGlyLeuAlaGlyProAsnGlySerValLeuPro-----
                                                                                                                                                                                                                                                                                                                                                                            29603 ATCATTGTTAAGCTGGGCGCAATCTTCGTTTTGAAAACGGAGCCGTAACCGCC-
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SOFTWARE: Annomax Sequence Listing Engine vers: 1.1
SEQ ID NO 4449
LENGTH: 1969
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CURRENT APPLICATION NUMBER: US/09/864,761
CURRENT FILING DATE: 2001-06-23
PRIOR FILING DATE: 2000-02-04
PRIOR FILING DATE: 2000-02-04
PRIOR FILING DATE: 2000-06-26
PRIOR PRIOR DATE: 2000-06-36
PRIOR FILING DATE: 2000-06-37
PRIOR FILING DATE: 2000-06-37
PRIOR FILING DATE: 2000-09-37
PRIOR FILING DATE: 2000-09-37
PRIOR FILING DATE: 2001-01-30
PRIOR PRILING DATE: 2001-01-30
PRIOR APPLICATION NUMBER: PCT/USO1/00665
PRIOR APPLICATION NUMBER: PCT/USO1/00666
PRIOR FILING DATE: 2001-01-30
PRIOR APPLICATION NUMBER: PCT/USO1/00666
PRIOR FILING DATE: 2001-01-30
PRIOR FILING DATE: 2001-01-30
PRIOR APPLICATION NUMBER: PCT/USO1/00662
PRIOR FILING DATE: 2001-01-30
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PRIOR FILING DATE: 2001-01-30
PRIOR APPLICATION NUMBER: PCT/US01/00670
PRIOR FILING DATE: 2001-01-30
PRIOR APPLICATION NUMBER: US 60/234,687
PRIOR FILING DATE: 2000-09-21
PRIOR PILING DATE: 2000-06-30
PRIOR FILING DATE: 2000-06-30
PRIOR FILING DATE: 2000-06-30
PRIOR PILING DATE: 2000-06-30
PRIOR PILING DATE: 2001-01-29
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ογ	AlaValAsnF	
q	:::       :::	506
ογ	220 ArgProlleAlaPhcClyAspPhcGluIleThrGlyThrGlnArgTyrProGluGlnIle 239	527
q	1148 GAG 1146	Db 446 AGCCTTTTTGCCATAGGGCTGCACACTG
οy	240 ValSerGlyLeuAlaArgPheGlnProGlyThrProTyrAspLeuAspLeuLeu 257	
q	STTC	Db 386 ACAGATTCACCCAGGCAGACTCTCACGG
ò	258 LeuAspPheGlnGlnAlaLeuGluGlnAsnGlyHisTyrSerGlyAlaSerValGlnAla 277	Oy 544 ProPheThrArgThrLeuSerGlyAlaVa
q		GTG
ò	278 AspPheAspArgLeuGlnGlyAspArgValPro 288	Oy 564 Phe 564
d d	1055 GACCTGGATCGGGAGACTGTGCCAGAATACAACCTCAGCATCACCGCCGA 1005	Db 266 TTC 264
à		RESULT 13
5 A	1004 GACGCCGGAACCCTTCCCTCTCAGCCTTACAATAGTGCGTGTTCAAGTGCGGAACGCATC 945	us-09-864-761-Z119//c Sequence 21197, Application US/09864' ; Patent No. US20020048763A1
ογ	297 LysArgHisLysLeuGluThrGlyIleArgLeuAspSerGluTyrGlyLeuGlyGlyLys 316	; GENERAL INFORMATION: ; APPLICANT: Penn, Sharron G.
£		, APPLICANT: Rank, David R.
3		; APPLICANT: Hanzel, David K. ; APPLICANT: Chen, Wensheng
č	317 ILEALATYIASPTYTTYrAsnLeuPheAsnLysGlyTyrIleGlySer 332 :::	; TITLE OF INVENTION: HUMAN GENOME-DE: : TITLE OF INVENTION: GENE EXPRESSION
qq	917 TCTTCCTACGACGTTTACATTGAAGAAAACAACCTCCCGGGGCTCCAATACTAAACCTA 858	FILE REFERENCE: Acomica-X-1
ογ	333 ValValTrpAspMetAspLysTyrGluThrThrLeuAlaAlaGlyIleSerGlnProArg 352	CURRENT FILING DATE: 2001-05-23
qq	857 AGTGTCTGGGACCCCGAC	; PRIOR APPLICATION NUMBER: US 60/180 ; PRIOR FILING DATE: 2000-02-04
δ	353 AsnTyrargGlyAsnTyrTrpThrSerAsnValSerTyrAsnArgSerThrThrGlnAsn 372	; PRIOR APPLICATION NUMBER: US 60/207; PRIOR FILING DATE: 2000-05-26
q	830 AATGCTCGGCTTTCTTTCTC	PRIOR APPLICATION NUMBER: US 09/632
ò	e [ A	PRIOR APPLICATION NUMBER: GB 24263.
: 8		PRIOR APPLICATION NUMBER: US 60/236
ł		PRIOR APPLICATION NUMBER: PCT/US01/
<u> </u>	390 GIY1LeASpAlaArgueuGiyAlaGiuPhebeuAlaGiuGIyArguysileProGiySer 409 	; PRIOR FILING DATE: 2001-01-30 ; PRIOR APPLICATION NUMBER: PCT/US01/(
3 6	מסקיים מיניים וישרים	; PRIOR FILING DATE: 2001-01-30 ; PRIOR APPLICATION NUMBER: PCT/US01/
ò i	AsplieAspLeuGlyAsnSerHisAlaThrMetLeuThrAlaSerTrpLysArgGlnLeu:::    	; PRIOR FILING DATE: 2001-01-30 ; PRIOR APPLICATION NUMBER: PCT/US01/
a a	722CTAGACTATGAGGATCGGGGGAATTTGAATTAACAGCT	PRIOR FILING DATE: 2001-01-30
ογ	430 LeuAsnAsnValLeuHisProGluAsnGlyHisTyrLeuAspGlyLysIleGlyThrThr 449	PRIOR FILLING DATE: 2001-01-30 PRIOR APPLICATION NIMBER: PCT/11S01 / 1
qq	683 669	PRIOR FILLING DATE: 2001-01-30
δ	450 LeuGlyThrPheLeuSerSerThrAlaLeuIleArgThrSerAlaArgAlaGlyTyrPhe 469	PRIOR FILING DATE: 2001-01-30
QQ	668	; PRIOR APPLICATION NUMBER: PCT/USO1/ ; PRIOR FILING DATE: 2001-01-30
ò	470 PheThrProGluAsnLysLysLeuGlyThrPheIleIleArqGlyGlnAlaGlyTvrThr 489	; PRIOR APPLICATION NUMBER: PCT/US01/ ; PRIOR FILING DATE: 2001-01-30
q		; PRIOR APPLICATION NUMBER: PCT/US01/( ; PRIOR FILING DATE: 2001-01-30
å	490 ValalabrakendendiakenValproComfirionMotohokaroonenjiinta 600	; PRIOR APPLICATION NUMBER: US 60/234
3 8		PRIOR FILING DATE: 2000-09-21 PRIOR APPLICATION NUMBER: 02 09/608
3 ,	2	; PRIOR FILING DATE: 2000-06-30 ; PRIOR APPLICATION NUMBER: US 09/774
ογ	509	; PRIOR FILING DATE: 2001-01-29 ; NUMBER OF SEO ID NOS: 49117
6	GTGGAGATGCTGCCTCGAGGTACCTCAGCTGGCCACCTAGTGTCACGGGTGGTAGGC	SOFTWARE: Annomax Sequence Listing 1: SEO ID NO 21197
ογ	515 GluLeuAspSerIleGlyLeuAlaGlyProAsnGly 526	; LENGTH: 2004

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RIVED SINGLE EXON NUCLEIC ACID PROBES USEFUL FC
N ANALYSIS BY MICROARRAY
                                           TCTCCTACAGTCTCTTGGGATCCCCTAACCAG 447
                               GTCAAATCAGTACTGCCCGTCCAGTCCAAGAC 387
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1080 ATCGCTTTGCTC-----GATGTGACTGACTGACTG------GATGCTGGC 1045
---SerSerValArgGlyTyr 514
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                                                                                                                ArgProlleAlaPheGlyAspPheGluIleThrGlyThrGlnArgTyrProGluGlnIle 239
                                                                                                                                                                                  ValSerGlyLeuAlaArgPheGln-----ProGlyThrProTyrAspLeuAspLeuLeu 257
                                                                                                                                                                                                                                                                                                                                                    GACCTGGATCGG------GAGACTGTGCCAGAATACAACCTCAGCATCACCGCCCGA 901
                                                                                                                                                                                                                                                                                                                                                                                                                                                        LysArgHisLysLeuGluThrGlyIleArgLeuAspSerGluTyrGlyLeuGlyGlyLys 316
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       -----TCTCAA 814
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             373 LeuGluLysArgAlaPheSerGly-----GlyIleTrpTyrValArgAspArg---Ala
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          490 ValAlaArgAspAsnAlaAspValProSerGlyLeuMetPheArgSerGlyGlyAla---
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                                                                                                                                                                                                      LeuAspPheGlnGlnAlaLeuGluGlnAsnGlyHisTyrSerGlyAlaSerValGlnAla
                                                                                                                                                                                                                                                                                     CTCAAG-----CTCAAG------CAATTACTTCACTTGAAAACCAGTGCA
                                                                                                                                                                                                                                                                                                                    AspPheAspArgLeuGlnGlyAspArgValPro-----------
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                                             ArgAlaAlaValAsnProAspThrAlaThrValAspLeuAsnValValValAspSerGly
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TYPE.

ORGANISM: Homo SADIEL.

ORGANISM: Homo SADIEL.

ORGANISM: Homo SADIEL.

FEATURE:

OTHER INFORMATION: EXPRESSED IN BIA74, SIGNAL = 1.2

OTHER INFORMATION: EXPRESSED IN LUNG, SIGNAL = 3.5

OTHER INFORMATION: EXPRESSED IN HELA, SIGNAL = 1.2

OTHER INFORMATION: EXPRESSED IN HELA, SIGNAL = 1.2

OTHER INFORMATION: EXPRESSED IN PLACENTA, SIGNAL = 1.2

OTHER INFORMATION: EXPRESSED IN PLACENTA, SIGNAL = 1.7

OTHER INFORMATION: EXPRESSED IN HEART SIGNAL = 1.7

OTHER INFORMATION: EXPRESSED IN HEART SIGNAL = 1.7

OTHER INFORMATION: EXPRESSED IN HEART SIGNAL = 1.9

OTHER INFORMATION: SYRESSED IN HEART SIGNAL = 1.9
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Conservative:
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                                        --LeuProLeuIleThrGlnGlnGluGluVal--
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  GTGGAGATGCTGCCTCGAGGTACCTCAGCTGGCCACCTAGTGTCACGGGTGGTAGGCTGG 403
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                                        .....SerIleGlyLeuAlaGly---ProAsnGly
                                                                  SECULIA III III IIIIII GACGCGGATGCCAGGTCTCCTACAGTCTCTTGGGATCCCCTAAACCAG
                                                                                                                                                                                             ------ProGluArgAlaLeuLeuVal------GlySerLeuGluTyrGlnLeu
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 GENERAL INFORMATION:
APPLICANT: Nichols, Scott E.
TITLE OF INVENTION: Glucan-containing Compositions and Paper
FILE REFERENCE: 035702.
FILE REFERENCE: 035702.
CURRENT FILING DATE: 1990-12-19
CRIRENT FILING DATE: 1990-12-11
PRIOR PELICATION NUMBER: 09/007, 999
PRIOR FILING DATE: 1998-01-16
PRIOR FILING DATE: 1998-01-20
PRIOR FILING DATE: 1998-01-20
PRIOR FILING DATE: 1998-01-20
PRIOR FILING DATE: 1998-01-20
PRIOR FILING DATE: 1998-01-16
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Matches:
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; LOCATION: (199)...(4326)
US-09-740-274-3
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Best Local Similarity:
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SEQ ID NO 3
LENGTH: 4896
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3448 TTAGTTAACCCAAATCACGGAACAAGCAGTTCTGTAACTGGATTGGTATTTGATGGTAAA 3507
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                                                                                                                                                       SerGlyGlyIleTrpTyrValArgAspArg------AlaGlyIleAspAla 393
                                                                                                                                                                                                                               394 ArgLeuGlyAlaGlu-----PheLeuAlaGluGlyArgLysIleProGlySerAspIle 411
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                                                                                                                                                                                                                                                                                                                                                                                                                 -----ValSerTyrAsnArgSerThrThrGlnAsnLeuGluLysArgAlaPhe----
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APPLICANT: Xu, H. Howard
TITLE OF INVENTION: Identification of Essential Genes in
TITLE OF INVENTION: Prokaryotes
FILE REFERENCE: ELITRA.011A
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Sequence 8513, Application US/09815242
Patent No. US20020061569A1
GENERAL INFORMATION:
APPLICANT: Haselbeck, Robert
APPLICANT: Ohlsen, Kari L.
APPLICANT: Syskind, Judith W.
APPLICANT: Tyskind, Judith W.
APPLICANT: Trawick, John D.
APPLICANT: Trawick, John D.
APPLICANT: Carr, Grant
APPLICANT: Carr, Grant
APPLICANT: Xu, H. Howard
---TyrArgGlyAsnTyrTrpThrSerAsn-
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3010 TCTTTAAATACAGCAATGGGTAACTTAATT-----AATGCGATTGCAGATCATCAAGCC 3063
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Mismatches:
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         CURRENT FILING DATE: 2001.03-21
PRIOR APPLICATION NUMBER: 60/191,078
PRIOR FILING DATE: 2000-03-21
PRIOR FILING DATE: 2000-03-21
PRIOR APPLICATION NUMBER: 60/206,848
PRIOR APPLICATION NUMBER: 60/207,727
PRIOR FILING DATE: 2000-05-28
PRIOR FILING DATE: 2000-05-28
PRIOR FILING DATE: 2000-11-27
PRIOR FILING DATE: 2000-12-22
PRIOR FILING DATE: 2001-22-25
PRIOR FILING DATE: 2001-22-16
NUMBER OF SEQ ID NOS: 14110
SOFTWARE: FREASED for WINGOWS Version 4.0
SEQ ID NO 8513
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CURRENT APPLICATION NUMBER: US/09/815,242
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ORGANISM: Staphylococcus aureus
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34.81%
20.18%
3.42%
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Best Local Similarity:
Query Match:
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US-09-815-242-8513
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217   AspSerCilyArgProliaAlaPhaGlyAsPPheGlullerhrCilyPhicGlnArgPyPPD 236   Alignment 237 Global Control Cont	6 6	VOLTANTICORDITION AND AND AND AND AND AND AND AND AND AN	; US-1	OTHER INFORM -10-044-090-98	ξ <u>φ</u>
3986   WITCHCOCKCONTACATICATION   1111   1111   1111   1111   1111   1111   1111   1111   1111   1111   1111   1111   1111   1111   1111   1111   1111   1111   1111   1111   1111   1111   1111   1111   1111   1111   1111   1111   1111   1111   1111   1111   1111   1111   1111   1111   1111   1111   1111   1111   1111   1111   1111   1111   1111   1111   1111   1111   1111   1111   1111   1111   1111   1111   1111   1111   1111   1111   1111   1111   1111   1111   1111   1111   1111   1111   1111   1111   1111   1111   1111   1111   1111   1111   1111   1111   1111   1111   1111   1111   1111   1111   1111   1111   1111   1111   1111   1111   1111   1111   1111   1111   1111   1111   1111   1111   1111   1111   1111   1111   1111   1111   1111   1111   1111   1111   1111   1111   1111   1111   1111   1111   1111   1111   1111   1111   1111   1111   1111   1111   1111   1111   1111   1111   1111   1111   1111   1111   1111   1111   1111   1111   1111   1111   1111   1111   1111   1111   1111   1111   1111   1111   1111   1111   1111   1111   1111   1111   1111   1111   1111   1111   1111   1111   1111   1111   1111   1111   1111   1111   1111   1111   1111   1111   1111   1111   1111   1111   1111   1111   1111   1111   1111   1111   1111   1111   1111   1111   1111   1111   1111   1111   1111   1111   1111   1111   1111   1111   1111   1111   1111   1111   1111   1111   1111   1111   1111   1111   1111   1111   1111   1111   1111   1111   1111   1111   1111   1111   1111   1111   1111   1111   1111   1111   1111   1111   1111   1111   1111   1111   1111   1111   1111   1111   1111   1111   1111   1111   1111   1111   1111   1111   1111   1111   1111   1111   1111   1111   1111   1111   1111   1111   1111   1111   1111   1111   1111   1111   1111   1111   1111   1111   1111   1111   1111   1111   1111   1111   1111   1111   1111   1111   1111   1111   1111   1111   1111   1111   1111   1111   1111   1111   1111   1111   1111   1111   1111   1111   1111   1111   1111   1111   1111   1111   1111   1111   1111   1	ογ	AspSerGlyArgProlleAlaPheGlyAspPheGlulleThrGlyThrGlnArgTyrPro	Alig Pred	Alignment Scores: Pred. No.:	83
237 GLIGH INTERCALTAGE AND LANGES	QQ	ATACAACGAAAGCAGCATTACATGGTGATGTGAAGTTACAAAATGATAAAGATCATGCT	Perc	e: ent Similar	Ξ.
3546   AAACAACCATTAGCATTTTAGCATATCTAAACAATCCCACAAACCACTTGAAATTTCCTCAATTTAGCATTACTAATCAATC	ò	GluGlnIleValSerGlyLeuAlaArgPheGlnProGlyThrProTyrAspLeuAspLeu :::	Best Quer DB:	. Local Simi y Match:	<del>-</del>
227   Leuichalp PheClicinAlaceuGluGinAsmClyHistyrSerCiyalaserValCir   376   TiGATTGANACTGANACTGANCTGANGTGANGTGANGTGANG	qq	AAACAAACGGTTAGTCAATTAGCATATCTAAACAATGCACAAAAACATATGGAAGATACG	- 81	9-857-669-2	-
3706 frightformatcharcharcharcharcharcharcharcharcharchar	ογ	LeuLeuAspPheGlnGlnAlaLeuGluGlnAsnGlyHisTyrSerGlyAlaSerValGln     :::    :::	,	41 Serbroasn	, ĉ
277   AlaAspPheAspArglewGinGlyAspArgVallSerValIngVallSerValIngVallSerValInVal 296   237   237   237   237   237   237   237   237   237   237   237   237   237   237   237   237   237   237   237   237   237   237   237   237   237   237   237   237   237   237   237   237   237   237   237   237   237   237   237   237   237   237   237   237   237   237   237   237   237   237   237   237   237   237   237   237   237   237   237   237   237   237   237   237   237   237   237   237   237   237   237   237   237   237   237   237   237   237   237   237   237   237   237   237   237   237   237   237   237   237   237   237   237   237   237   237   237   237   237   237   237   237   237   237   237   237   237   237   237   237   237   237   237   237   237   237   237   237   237   237   237   237   237   237   237   237   237   237   237   237   237   237   237   237   237   237   237   237   237   237   237   237   237   237   237   237   237   237   237   237   237   237   237   237   237   237   237   237   237   237   237   237   237   237   237   237   237   237   237   237   237   237   237   237   237   237   237   237   237   237   237   237   237   237   237   237   237   237   237   237   237   237   237   237   237   237   237   237   237   237   237   237   237   237   237   237   237   237   237   237   237   237   237   237   237   237   237   237   237   237   237   237   237   237   237   237   237   237   237   237   237   237   237   237   237   237   237   237   237   237   237   237   237   237   237   237   237   237   237   237   237   237   237   237   237   237   237   237   237   237   237   237   237   237   237   237   237   237   237   237   237   237   237   237   237   237   237   237   237   237   237   237   237   237   237   237   237   237   237   237   237   237   237   237   237   237   237   237   237   237   237   237   237   237   237   237   237   237   237   237   237   237   237   237   237   237   237   237   237   237   237   237   237   237   237   237   237	q O	TTGATTGATAGTGAAACAACT	7 6		_ <del>j</del>
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297   1ys	Q C	AGAATAGCAGTTAAGCAAGATTGACTGAAGC	7 8		ĕ
300 CANACOLITEGRICAL CALTAGRANGATION   38 19   38 19   38 10   38 19   38 20   38 20   38 20   38 20   38 20   38 20   38 20   38 20   38 20   38 20   38 20   38 20   38 20   38 20   38 20   38 20   38 20   38 20   38 20   38 20   38 20   38 20   38 20   38 20   38 20   38 20   38 20   38 20   38 20   38 20   38 20   38 20   38 20   38 20   38 20   38 20   38 20   38 20   38 20   38 20   38 20   38 20   38 20   38 20   38 20   38 20   38 20   38 20   38 20   38 20   38 20   38 20   38 20   38 20   38 20   38 20   38 20   38 20   38 20   38 20   38 20   38 20   38 20   38 20   38 20   38 20   38 20   38 20   38 20   38 20   38 20   38 20   38 20   38 20   38 20   38 20   38 20   38 20   38 20   38 20   38 20   38 20   38 20   38 20   38 20   38 20   38 20   38 20   38 20   38 20   38 20   38 20   38 20   38 20   38 20   38 20   38 20   38 20   38 20   38 20   38 20   38 20   38 20   38 20   38 20   38 20   38 20   38 20   38 20   38 20   38 20   38 20   38 20   38 20   38 20   38 20   38 20   38 20   38 20   38 20   38 20   38 20   38 20   38 20   38 20   38 20   38 20   38 20   38 20   38 20   38 20   38 20   38 20   38 20   38 20   38 20   38 20   38 20   38 20   38 20   38 20   38 20   38 20   38 20   38 20   38 20   38 20   38 20   38 20   38 20   38 20   38 20   38 20   38 20   38 20   38 20   38 20   38 20   38 20   38 20   38 20   38 20   38 20   38 20   38 20   38 20   38 20   38 20   38 20   38 20   38 20   38 20   38 20   38 20   38 20   38 20   38 20   38 20   38 20   38 20   38 20   38 20   38 20   38 20   38 20   38 20   38 20   38 20   38 20   38 20   38 20   38 20   38 20   38 20   38 20   38 20   38 20   38 20   38 20   38 20   38 20   38 20   38 20   38 20   38 20   38 20   38 20   38 20   38 20   38 20   38 20   38 20   38 20   38 20   38 20   38 20   38 20   38 20   38 20   38 20   38 20   38 20   38 20   38 20   38 20   38 20   38 20   38 20   38 20   38 20   38 20   38 20   38 20   38 20   38 20   38 20   38 20   38 20   38 20   38 20   38 20   38 20   38 20   38 20   38 20   38 20   38 20	δ d		Qy	62	•
1320   CTGCCGCGCGCGCGCGCGCGCATAAAAAAAAAAAAAAAA	3 8		Dβ	2118 GGGCAAAGG	3
323 AsnicupheAsnicgIyTrIleGlySerValVAlTrpAspWetAspLysTyrGluthr 342   09   111     384	, a	74114	QY	91 uAlaGluGl	Ţ
3874	ò	ութեւ	qq	2178 ACCCTCTCC	يَ
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363 ValSerTyrAsnArgSerThrThrGlnAsnLeuGluLysArgalaPheSerGlyGlyIlle 382  3949 GCGCCACAAGCACGTGACAACATTACAAAATTIIIIIIIIII	QQ	TCTATCATTGCAGGATTAAATAATCCGACTATCAATAAAGGAAATGTATCAAGT	φy	131 rgThrLysI	윤
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403 GlyArgLys1leProGlySerAspIleAspLeuGlyAsnSerHisAlaThrMetLeuThr 422  409 GATAAGCAAACAGCAGCAGAAATTCTCTGAATCATTAGATCAATTAACA 4056  423 AlaSerTrpLySArgGlnLeuLeuAsnAsnVal 433  4057 CCAGCTCAACACACACACACACACTTAGAAATT 4089  SULT 16  4057 CCAGCTCAACACACACACACACATTAGAAATT 4089  SULT 16  4057 CCAGCTCAACACACACACACACACACACACACACACACAC	a		ογ	171 spGlnAspS	Ä
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                                                         294 hrGluVal------LysArgHisLysLeuGluThrGlyIleArgLeuA 308
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PALEAR NO. US 20020111057A1

PATENT NO. US 20020111057A1

APPLICANT: Young, Paul

TITLE OF INVENTION: Process for Identifying Anti-Cancer Therapeutic Agents Using C

TITLE OF INVENTION: Sets

FILE REFERENCE: 689290-76

CURRENT PAPLICATION NUMBER: US/60/233,617

PRIOR APPLICATION NUMBER: US/60/234,052

PRIOR FILING DATE: 2000-09-20

PRIOR FILING DATE: 2000-09-26

PRIOR APPLICATION NUMBER: US/60/235,134

PRIOR FILING DATE: 2000-09-25

PRIOR FILING DATE: 2000-09-26

PRIOR PAPLICATION NUMBER: US/60/235,711

PRIOR PAPLICATION NUMBER: US/60/235,71

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PRIOR FILING DATE: 2000-09-27

PRIOR PAPLICATION NUMBER: US/60/235,720

PRIOR PAPLICATION NUMBER: US/60/235,840

PRIOR PAPLICATION NUMBER: US/60/235,840
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  12286 ATCATCGACCCTGAGGAGAGCCACCGGCTGCCGTGGAGGTGGCCTACAAGCGCGGCCTC 12345
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              12346 TTCGATGAGGAGATGAACGAGATGCTGACCGACCCTCGGACGAC------ 12390
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   CIGCAGCTGATGGAGCGTTGTATCACTGACCCCCAGACGGGCCTGTGTCTCTTGCCGCTG 12495
103 LeuArgSerLysGlyTyrPheSerSerLysValSerLeuThrGluLysAspGlyAlaTyr 122
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     ----ThrValHisIleThrProGlyProArgThrLysIleAlaAsnValGly--- 138
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      64 IleLysAspMetValGluGluHis---LeuProLeuIleThrGlnGlnGlnGluGluVal 82
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       LeuAspLysGluGlnThrGlyPheLeuAlaGluGluAlaProAspAsnValLysThrMet
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     US-09-857-669-2 (1-609) x US-09-954-456-1601 (1-14800)
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Matches:
Conservative:
Mismatches:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Indels:
                                                                                                                                                                                                                                                                                                                                                                    Sequence 1601, Application US/09954456
Patent No. US20020115057A1
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ź		Db 13498
3 8	ANGUNDANGANGANGANGANGANGANGANGANGANGANGANGANGA	Oy 442
<u> </u>	139 Valatatebeugijaspitebeuseraspijakan heldiadilutyfryfragasnala 158 	Db 13558
ò	LeuGluksnTrpGlnGlnProValGlvSerAspPheAspGlnAsnTrpGlnAsn	Qy 459
: 셤		Db 13612
δ	178SerLysThrSerValLeuGlyAlaValThrArgLys 189	
qq	12676 ACCATCTCCTCGTCGACGGCGTGGTCAAGTCCATGATCATCGACGCCGCTCCGGGCGC 12735	Db 13645
οy	190 GlyTyrProLeuAlaLysLeuGlyAsnThrArgAlaAlaValAsnPro 205	
qq		13
Οy	206 ASPThrAlaThrValAspLeuAsnValValValAspSerGlyArgProIle 222	Qy 516
QΩ	12796 TACCGCGCCGCACGCTCTCCATCACCGACTTCGCCGACATGCTCTCGGGCAACGCCGGT 12855	13
ογ	223 AlaPheGlyAspPheGluIleThrGlyThrGlnArgTyrProGluGlnIleVal 240	
qq	12856 GGTTTCCGCTCCCGTTCCTCGGTGGGATCCTCCTCCTCCTCCTATCAGC 12909	
οy	241 SerGlyLeuAlaArgPheGlnProGlyThrProTyrAspLeuAspLeuLeuLeuAspPhe 260	RESULT 18 US-09-974-
qq	12910 CCCGCCGTCTCCAGGACCCAG	
δλ	261 GinGinAlaLeuGluGinAsnGlyHisTyrSerGlyAlaSerValGinAlaAspPheAsp 280	G
q	12943 TCAGACCCCACTGAGGAGGCCCCGTGGCTGCATCCTGGACACGGAG 12993	; APPLICA ; TITLE O
δō	281 ArgLeuGlnGlyAspArgValProValLysValSerValThrGluValLysArgHisLys 300	TITLE O
đ	12994 ACGCTGGAGAAGGTGTCCATCACCGAGGCCATGCACCGGAAC 13035	
ογ	301 LeuGluThrGlyIleArgLeuAspSerGluTyrGlyLeuGlyGlyLys 316	PRIOR
qq	13036 CTGGTGGATAACATCACGGGGAGCGGCTGCTGGAGGCGCAGGCCTGCACCGGGGGCATC 13095	
δ	317 IleAlaTyrAspTyrTyrAsnLeuPheAsnLysGlyTyrIle 330	t
đ	13096 ATCGACCCCAGCACCGGTGAGCGCTTCCCTGTCACCGACGCCCTCAACAAGGGCCTGGTG 13155	LENGTH
ογ	331 GlySerValValTrpAspMetAspLysTyrGluThrThrLeuAlaAlaGlyIleSerGln 350	CREANI CREANI
qq	13156 GACAAGATCATGGTGGACCGCATCAACCTGGCCCAGAAGGCCTTTTGCGGCTTCGAGGAC 13215	#/6-60-S0
φ	351 ProArgAsn360	Pred. No.:
Ωp	13216 CCACGCACCAAGACCAAGATGTCGGCCGCCCAGGCCCTGAAGAGGGCTGGCTC 13269	Score: Percent Si
oy	SerAsnValSe	Dest Local Query Matc DB:
셤	TACTACGAGGCCGGCCAGCGCTTCCTGGA	- VS-09-857-
ð í	GlylleTrpTyrvalArgAspArgAla	Qy 6
9 8	GUCTTEATUGAGCCCGGCCCGCGCCGTCCCCTGGACGAGCCCTGCAGCGCGCGC	Db 91
<u> </u>	330 GIVITEASPALAARGLEUULIYALAGIUPNELEUALAGIUGIYARG	Qy 20
è	0.17.27.18.18.18.19.19.19.19.19.19.19.19.19.19.19.19.19.	Db 151
3 8		Qy 31
ò		Db 208
7		Qy 51

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AGCCCCTACAGGGGGCTCCGGCTCTACCGCTCGCACCGGCTCG----- 13611
                                                                                                                     3AGGAGGGCACGGGGCTGCGGCTGCTGGAGGCTGCCGCGCAGTCCACCAAGGGCTACTAC 13557
                                                                                                                                                                                                     ThrPheIleIleArgGlyGlnAlaGlyTyrThrValAlaArgAspAsnAlaAspValPro 498
                                                                                                                                                                                                                                                                                        Ser------GlyLeuMetPheArgSerGlyGlyAlaSerSerValArgGlyTyrGlu 515
                                                                                                                                                                                                                                                                                                                                                                        LeuAspSerIleGlyLeuAlaGlyProAsnGlySerValLeuProGluArgAlaLeuLeu 535
                                                                                                                                                                                                                                                                                                                                                                                                                                                         ValGlySerLeuGluTyrGlnLeuProPheThrArgThrLeuSerGlyAlaValPheHis 555
                                        LeuAspGlyLysIle-----GlyThrThrLeuGlyThrPheLeuSerSerThrAla 458
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          GCAACGCCT-----GAAGTTCCC 249
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      :::||||||||:::
|TCCGGGGTGATGTTCATCTGTTTTTCCATGTGAGGCGGGAGTCCCTCGACCTCGAT 150
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         TATTTCGATCAGGGGAATACGATCTATGGCGGGGACA---GTTGAAGACCAAAAG 207
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  -----TyrAlaProAlaAspLeuSerGluAsnLys 30
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     AlaalaGlyPheAlaLeuPheLysAsnLysSerProAspThrGluSerValLysLeuLys 50
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     ProLysPheProValArgIleAspThrGlnAspSerGluIleLysAspMetValGluGlu 70
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                ThralaLeuLeuLeuProalaLeuPhePhePhe-----proHisala-----
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     TABLE TO THE SECRET READY M.

FLICANT: Berke, Randy M.

FLICANT: Clausen, ID Groth

FLE OF INVENTION: Expression

E. REPERENCE: 10085.500-US

REBUT APPLICATION NUMBER: US/09/974,300

RRENT FILING DAFE: 2001-10-05

FOR FILING DAFE: 2001-10-06

FOR APPLICATION NUMBER: 09/680,598

FOR APPLICATION NUMBER: 00/660

FOR PELING DAFE: 2000-10-06

FOR APPLICATION NUMBER: 00/279,526

FOR FILING DAFE: 2001-03-27

FURNE: FastSEQ for Windows Version 4.0

ID NO 2290
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103
200
205
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Matches:
Conservative;
Mismatches:
Indels:
Gaps:
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               e 2290, Application US/09974300
No. US20020146721A1
INFORMATION:
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106.50
36.02%
19.75%
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al Similarity:
tch:
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qq	250 GACCAGTACACTTTGAAAAAGAGTACTCTGACAACAGGGTCGACCTTGTCTCATCG 306	1150
Oy Db	71 HisLeuProLeulleThrGinGlnGlnGluGluValLeuAspLysGluGlnThrGlyPhe 90 	Qy 391 IleAspAlaArgLeuGLyAlaGluPhel
oy ob	LeuAlaGluGluAlaProAspAsnValLysThrMetLeuArgSerLysGlyTyrPheSer	Oy 411 IleAspLeuGlyAsnSerHisAlaThrh  [11:::
Oy Dp	SerLysValSerLeuThrGluLysAspGlyAlaTyrThrValHisIleThrPro	Oy 431 AsnAsnValLeuHisProGluAsnGlyF 
yo 4	GlyProArgThrLysIleAlaAsnValGlyValAlaIleLeuGlyAspIleLeuSerAsp	Oy 451 GlyThrPheLeuSerSerThrAlaLeu1       :::               Db 1285CTGTTTACCCTGCAGCTGR
3 6 8		Oy 471 ThrProGluAsnLysLysLeuGlyThrE :::::
S G		Qy 488 TyrThrvalalaArgAspAsnAlaAspV :::111 Db 1375 TCGTCAGTT
රු සි	ASPPheAspGlnAspSerTrpGluAsnSerLysThrSerValLeuGlyAla	Oy 506 GlyGlyAlaSerSerValArgGlyT 
Oy Op	186 ValThrArgLysGlyTyrProLeuAlaLysLeuGlyAsnThrArgAlaAlaValAsnPro 205         ::: 718 GTACAGCAGGTACAAGACAG 741	Qy 525 AsnGlySerValLeuProGluArgAlal
Oy Dp	FalaThrValAspLeuAsnValValValAspSerGlyArgProlleAlaPheGly	
Qy Db	226 AspPheGlulleThrGlyThrGlnArgTyrProGluGlnIleValSerGlyLeuAlaArg 245     :::        793 AAGCTCGAATTGACAGGG	Qy 551GlyAlaValPheF 
\$ 6	246 PheGlnProGlyThrProTyrAspLeuAspLeuLeuLeuAspPheGlnGlnAla 263	RESULT 19 US-0974-300-2620 ; Sequence 2620, Application US/099743 ; Patent No. US20020146721A1
oy Db	264 LeuGluGlnAsnGlyHisTyrSerGlyAlaSerValGlnAlaAspPheAspArgLeuGln 283 	
oy Ob	284 GlyAspArgValProValLysValSerValThrGluValLysArgHisLysLeuGluThr 303 	; TITLE OF INVENTION: EXPRESSION ; FILE REFERENCE: 10085.500-US ; CURRENT APPLICATION NUMBER: US/OS ; CURRENT FILING DATE: 2001-10-05
Oy Dp	304 GlylleArgLeuAspSerGluTyrGlyLeuGlyGlyLysIleAlaTyrAspTyrTyrAsn 323 	; PRIOR APPLICATION NUMBER: 09/680,59; PRIOR FILING DATE: 2000-10-06; PRIOR APPLICATION NUMBER: 60/279,52; PRIOR FILING DATE: 2001-03-27
oy B	324 LeuPheAsnLysGlyTyrIleGlySerValValTrpAspMetAspLysTyr 340         :::   P94 CTGTTTCAGCAGCTTGAAATCGGCCATATCGGC	; NUMBER OF SEQ ID NOS: 8481 ; SOFTWARE: FastSEQ for Windows Ver ; SEQ ID NO 2620 ; LENGTH: 2140
Qy Db	341 GluthrthrLeualaalaGlyIleSerGlnProArgAsnTyrArgGlyAsn 357 	; TYPE: DNA ; ORGANISM: Bacillus licheniformis US-09-974-300-2620
oy Ob	358 TyrTrpThrSer	Alignment Scores: 0.025 Pred. No.: 106.50 Score: 106.50 Percent Similarity: 36.028 Best Local Similarity: 19.758
δò	371 GlnAsnLeuGluLysArgAlaPheSerGlyGlyIleTrpTyrValArgAspArgAlaGly 390	

QQ	1150	GGCACGTTCAACTATGGAATCGGAACGTATTTCTTA1185
Οy	391	GlyArgLyslleProGlySerAsp 4
qa	1186	ATGCCGGTATACTGTT
Qy	411	IleAspLeuGlyAsnSerHisAlaThrMetLeuThrAlaSerTrpLysArgGlnLeuLeu 430
qq	1222	CATAACGCGAGGGCGAAAATTCTCCAGGCCGGTTTATTTGTCTCTCTGATC 1272
٥y	431	AsnAsnValLeuHisProGluAsnGlyHisTyrLeuAspGlyLysIleGlyThrThrLeu 450
qa	1273	AACATCGTTGTT1284
Qy	451	GlyThrPheLeuSerSerThrAlaLeuIleArgThrSerAlaArgAlaGlyTyrPhePhe 470
Db	1285	TIGTTTACCCTGCAGTGATTCAAAACACGGGGGAAACCGGGCTT 1329
Οy	471	ThrProGluAsnLysLysLeuGlyThrPhellelleArgGlyGlnAlaGly 487
QQ	1330	GAGATGGGTACATATCTTGTCATGGGGGGGGGTGTCCGGCATCGGA 1374
Οy	488	TyrThrvalAlaArgAspAsnAlaAspValProSerGlyLeuMetPheArgSer 505
ΟD	1375	TCGTCAGTT
Qy	206	GlyGlyAlaSerSerValArgGlyTyrGluLeuAspSerIleGlyLeuAlaGlyPro 524
da	1417	H
oy.	525	ProGluArgAlaLeuLeuValGlySerLeuGluTyr 541
qq	1465	AATCATCCGCTGCTCCGCAAAATTCTGACGGAAACACCGGGCACATACCATCAC 1518
Qy	542	euProPheThrArgThr
QO	1519	AGCGTTATGGTCGCGAACTTATCTGAGGCGGCATGCGAAGCGGTCGGAGCAAACGG 1575
09	551	
QQ	1576	
RES PEC	RESULT 19 (US-09-974-300-26 Sequence 2620, Patent No. USZ GENERAL INFORM APPLICANT: C TITLE OF INVE TITLE OF INVE TITLE OF INVE TITLE OF INVE FILE REPERENC CURRENT APPLICANT: CURRENT APPLICANT PRIOR FILING PRIOR FILING PRIOR FILING PRIOR FILING ORDAN APPLICANT PRIOR FILING PRIOR FILING PRIOR FILING ORDAN APPLICANT TYPE: DAS SOFTWARE: FAS SOFTWARE: FAS SOFTWARE: AND TYPE: DAS SOFTWARE: AND TYPE: AND TYPE	GCAAGGGTCGGCGCCTATTACCATGATATCGGC 161  20 Application US/09974300 APPLICATION US/09974300 ATTON: ATTON: ATTON: ATTON: ATTON: ATTON NUMBER: US/09/974,300 G DATE: 2001-10-05 G DATE: 2001-10-06 TION NUMBER: US/09/974,300 G DATE: 2001-10-06 TION NUMBER: US/09/974,300 CITION NUMBER: US/09/974,300 COAPE: 2001-10-06 TION NUMBER: US/09/974,300 CITIUS Licheniformis  CIIIUS licheniformis  CIIIUS licheniformis  COOSE Matches: US 36.024 Mismatches: ATTON HORSE US 10-754 MISMATCHES US

us-09-857-669-2.rnpb

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206 AspThrAlaThrValAspLeuAsnValValValAspSerGlyArgProlleAlaPheGly 225
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 226 AspPheGluIleThrGlyThrGlnArgTyrProGluGlnIleValSerGlyLeuAlaArg 245
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          GlyIleArgLeuAspSerGluTyrGlyLeuGlyGlyLysIleAlaTyrAspTyrTyrAsn 323
                                                      LeuAlaGluGluAlaProAspAsnValLysThrMetLeuArgSerLysGlyTyrPheSer 110
                                                                                                                                                                                                                                                                                                                                                                                                                                                                      SerLysVal-----SerLeuThrGluLysAspGlyAlaTyrThrValHisIleThrPro 128
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               GlyProArgThrLysIleAlaAsnValGlyValAlaIleLeuGlyAspIleLeuSerAsp 148
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    ------GlyAsnLeuAlaGluTyrTyrArgAsnAla------------ 158
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 ||||:::|||
598 AATTCGATACCTICAAAATTAAAAACGCCGCTGATGAAATCGGACGCTTTGCGATCATT 657
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                ------AspPheAspGlnAspSerTrpGluAsnSerLysThrSerValLeuGlyAla 185
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        LeuGluGlnAsnGlyHisTyrSerGlyAlaSerValGlnAlaAspPheAspArgLeuGln 283
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 TIGGIT ----TACTAT ----- 909
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                                                                                                                                    151 TTATTTTCGATCAGCGAGAATACGATCTATGCGCCGGCGACA---GTTGAAGACCAAAAG 207
                                                                                                                                                                                                                 208 GCAACGGCT-----GAGTACAAAAGCAGGAAGCGAGAGGGAGGG---GAAGTTCCC 249
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         418 TCCGATGTGACGGACTCGCTGTCACAGGATTCAGTCAAACACCTGCTGAGGGCCAGCGAC 477
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              478 GGAGAGCTTTCCATGACGCAGGATTCGGTCATCACCGCCGTCAATGACGTGATGAGCAAA 537
                                                                                                                                                                                                                                                    51 ProLysPheProValArgIleAspThrGlnAspSerGluIleLysAspMetValGluGlu 70
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           910 AGCAGCCGGATTCCGAAAACAAGTCG------CTCATGCTGTTTCGTTGATCACA
                                                                                                                                                                                                                                                                                    250 GACCAGTACACTITGAAAAAAGGTACTCTGACAACAGGGTC---GACCTTGTCATCG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        742 GGGCAGATACTCGTTCAGGAAATCAGCTGATCGACAGGGAA-----GTCTATCGA
                                                                                                        31 AlaAlaGlyPheAlaLeuPheLysAsnLysSerProAspThrGluSerValLysLeuLys
                                                                                                                                                                                                                                                                                                                        71 HisLeuProLeuIleThrGlnGlnGlnGluGluValLeuAspLysGluGlnThrGlyPhe
                                                                                                                                                                                                                                                                                                                                                                                                                                  367 CAGGCCCCATCTGAAAAGACCAGATCAAATCTGTT-----GAAGAAAAGCTGACT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    538 GANATCCGCCCAGGAAAGCTCGATGAAGCGAAAGAACATGTAACGAAAGAACTGAAGGC
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                658 CCCAATTACGTATCCTGACAAGACGGAGCAGGAGCGTCAAGAAGCGGCTGACAGCAGC
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       ValThrArgLysGlyTyrProLeuAlaLysLeuGlyAsnThrArgAlaAlaValAsnPro
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       PheGlnPro-----GlyThrProTyrAspLeuAspLeuLeuAspPheGlnGlnAla
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        TTCAAACCTGTCGGCGGACTG------CTGCTTTTAATCGCGCTTTTCATCTAGCT
                                   ThrAlaLeuLeuProAlaLeuPhePhe-----ProHisAla
US-09-857-669-2 (1-609) x US-09-974-300-2620 (1-2140)
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                                            LeuPheAsnLys....-GlyTyrIleGlySerValValTrpAspMetAspLysTyr 340
                                                                                                                               341 GluThrThrLeuAlaAlaGlyIleSerGlnProArg------AsnTyrArgGlyAsn 357
-ATCGTCATGGAAGTGATCAGC 993
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APPLICANT: Sparling, P. Frederick
APPLICANT: Cornelissen, Cynthia N.
TITLE OF INVENTION: Transferrin-Binding Proteins From
TITLE OF INVENTION: Nelsseria Gonorrhea and Neisseria Meningitidis
NUMBER OF SEQUENCES: 8
CORRESPONDENCE ADDRESS:
ADDRESSEE: Inclone Systems Incorporated
STREET: 180 Varick Street
                                                                                                                                                                                                                      -- AsnValSerTyrAsnArgSerThrThr
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STRAIN: FAM18, FAM20, B16B6, group X and group W135
                                 COMPUTER: IBM PC compatible
OPERATING SYSTEM: PC-DOS/MS-DOS
SOFTWARE: Patentin Release #1.0, Version #1.25
CURRENT APPLICATION DATA:
APPLICATION NUMBER: US/09/332,226
FILING DATE:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Length:
Matches:
Conservative:
Mismatches:
Indels:
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                                                                                                                                                                        PROCRAPPLICATION DATA:
APPLICATION NUMBER: US 07/973,336
FILING DATE: 05-NOV-1992
PHIOR APPLICATION DATA:
APPLICATION NUMBER: US 07/572,187
FILING DATE: 23-AUG-1990
ATTORNEY/AGENT INFORMATION:
                                                                                                                                                                                                                              APPLICA...

FILING DATE: 25-...
ATTORNEY/AGENT INFORMATION:
NAME: Gallagher, Thomas C.
REGISTRATION NUMBER: 37,066
REFERENCE/DOCKET NUMBER: SPA-1
TELECOMMUNICATION INFORMATION:
TELEFA: (212) 645-1405
TELEFA: (212) 645-105

INFORMATION FOR EACH OF SECTION: 3:
SEQUENCE CHARACTERISTICS:
LENGTH: 3537 base pairs
TYPE: nucleic acid
TYPE: nucleic acid
                                                                                                                  CLASSIFICATION:
PRIOR APPLICATION DATA:
APPLICATION NUMBER: 08/363,124
                      Floppy disk
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               0.0542
106.50
35.03%
21.95%
3.36%
           COMPUTER READABLE FORM:
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MOLECULE TYPE: CDNA
HYPOTHETICAL: NO
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Best Local Similarity:
                        MEDIUM TYPE:
                                                                                                                                                               FILING DATE:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     NAME/KEY:
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FEATURE:
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              NAME/KEY:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          ; LOCATION:
US-09-332-226-3
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                                                                                                                                                                                            1656 CCAATCATGGCTGTTCCGACCGGGTTGGCATTTTGGACAACCGCCATTATGTCGGAGCCGT 1715
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----LysGluGlnThrGlyPheLeuAlaGluGluAlaProAspAsnValLysThrMetLe 103
                                                                                                                                                                                                                                                                                          -----AlaTyrThrValHisIleThrProGlyProArgThrLysIleAlaAsnValGL 138
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                                                                                                                                               103 uArgSerLysGlyTyrPheSerSerLysValSerLeuThrGluLysAspGly-----
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             256 uLeuLeuAspPheGlnGlnAlaLeuGluGlnAsnGlyHisTyrSerGlyAlaSerValGl
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PRI	SEQ ; LE ; TY OR	US-09- Alignm Pred.	Score: Percen Best L Query	DB: US-09-	oy oy	oy Op	δ δ	Oy Dp	QY	da Db	δδ da	Oy Dp	da	දි ති	Oy	qq	yo g	- KO	qa	δō
y 397 aGlupheLeualaGluGlyArgLysIleProGlySerAspIleAspLeuGlyAsnSerHi 417     :::::   1941 CGAATATGTTTACCATAATCCTGATAAGGATACCTGGGCCGATTA 1985	y 417 salaThrMetLeuThrAlaSerTrpLysArgGlnLeuLeuAsnAsnValLeuHisProGl 437 	y 437 uAsnGlyHisTyrLeuAspGlyLysIleGlyThrThrLeuGlyThrPheLeuSerSerTh 457 	y 457 ralaLeulleargThrSeralaargalaGlyTyrPhePheThrProGluAsnLysLysLe 477 	y 477 uGlyThrPheIleIleArgGlyGlnAlaGlyTyrThrValAlaAr 492   :       targaagaagccgaaacctgtTcCaAgcagtattTaaaaaggcaTT 2174	y 492 gaspasnalaaspValProSerGlyLeuMetPheArgSerGlyGly 507 	y 508 516 :::::   :::     :::	y 517	y 520 yLeuAlaGlyProAsnGlySerValLeuProGluArgAlaLeuLeuValGlySerLeuGl 540	Oy 540 uTyrGlnLeuProPheThrArgThrLeuSerGlyAlaValPheHisAspMetGlyAspAl 560	560	Oy 580 eSerProLeuAlaProPheSerPheAspIleAlaTyrGlyHISSerAspLysLysIleAr 600	y 600 gTrpHisIleSerLeuGlyThr 607 :::              b 2542AGTGTCTACCGGCACT 2559	RESULT 21 US-09-912-020-139 ; Sequence 139, Application US/09912020 - Dafant No HS200700006560201				APPLICANT APPLICANT TITLE OF	TITLE OF INVENTION: ESCHERICHIA COLI FILE REFERENCE: ELITRA.001DV1		PRIOR FILING DATE: 2000-01-27 PRIOR APPLICATION NUMBER: 60/117,405
9 9	6 6	Oy Op	da Ga	ço G	9	S G	6 6	Q Pp	oy Db	65 62	oy Pp	9. 10.	αD							

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252 Tyr---AspLeuAspLeuLeuLeuLeuAspPheGlnGlnAlaLeuGluGlnAsnGlyHisTyr 270
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               307 ---LeuAspSerGluTyrGlyLeuGlyGlyLysIleAlaTyrAspTyrTyrAsnLeuPhe 325
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                358 AATTCAAACGCCAGTTACAGTATGTCAAACGATTTGAAAGGCGGCATGACCATCTA--- 414
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   355 ArgGlyAsnTyrTrpThrSerAsnValSerTyrAsnArgSerThrThrGlnAsnLeuGlu 374
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         435 HisProGluAsnGlyHisTyrLeuAspGlyLysIleGlyThrThrLeuGlyThrPheLeu 454
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        326 AsnLysGlyTyrIleGlySerValValTrpAspMetAsp---LysTyrGluThrThrLeu 344
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99 485 GINALaGLYTYTHIVALALARAGASPASNALAARGGGC	Alignment Scores: 0.0452 Length: 2055 Score: 104.00 Matches: 119 Percent Similarity: 36.28 Conservative: 100 Best Local Similarity: 19.70 Mismatches: 195 Query Match: 10 Mismatches: 195 DB: 10 Gaps: 36 US-09-857-669-2 (1-609) x US-09-974-300-2362 (1-2055)	laaspLeuSerGluasnLysal.                      CAGTTGAAGACCAAAAGGC. hrGluSerValLysLeuLysPr.                                         GAGAGAGGAAGTTCCGGA	Oy GINASpSerGluIleLysAspWetValGluGluHisLeuProLeuileThrGlnGlnGlnGln
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958 CTCATTAAACTGCTGATCAATGAAAGGCTGGCGATCCTGTCGAGCATGATTCTTTCCATT 1017
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138 GlyValAlaIleLeuGlyAspIleLeuSerAsp------GlyAsnLeuAlaGlu 153
                                                                                  106 GTCATCACCCCCTCAATGACGTGATGAGCAAAGAAATCCGCGCAGGAAAGCTCGATGAA 465
                                                                                                                                                         466 GCGAAAGAACATGTAACGAAAGAACTGAAGGGCAATTCGATACCTTCAAAATTAAAAAC 525
                                                                                                                                                                                                                     526 GCCGCTGATGAAATCGGACGCTTTGCGATCATTCCCAATTACGTATACGATCCTGACAAG 585
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                                                                                                                      ....-LeuGluAsn 161
                                                                                                                                                                                           162 TrpGlnGlnProValGlySer-----14spPheAspGlnAspSer 174
                                                                                                                                                                                                                                                             175 TrpGluAsnSerLysThrSerValLeuGlyAlaValThrArgLysGlyTyrProLeuAla 194
                                                                                                                                                                                                                                                                                                                                   195 LysLeuGlyAsnThrArgAlaAlaValAsnProAspThrAlaThrValAspLeuAsnVal 214
                                                                                                                                                                                                                                                                                                                                                                                                        215 ValValAspSerGlyArgProIleAlaPheGlyAspPheGluIleThrGlyThrGlnArg 234
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691 81 702 101 703 120 742 138 862 138 862 141 922 153	Oy 175 TrpGluAsnSerLysTh  Db 1102 GCAGAGCCTCTGTCAC  Qy 190  Db 1162 AAAAGCGATTCACAGAC  Qy 197 GlyAsnThrArgAlaAl  Qy 197 GlyAsnThrArgAlaAl  Db 1222 GACGAATCCAAAGCGAG  Qy 217 ASPSer  Db 1282 GATTCTTAAAGGTGAT  Qy 221 ProlleAlaPheGly  Db 1342 CCTCTAAAGGTGAT	236 1402 256 1462 276 1504 1543 316
Db 1186	APPLICANT: Clausen, Ib Groth APPLICANT: Clausen, Ib Groth TITLE OF INVENTION: Methods For Monitoring Multiple Gene TITLE OF INVENTION: Expression TITLE OF INVENTION UNMBER: US/09/974,300 CURRENT FILING DATE: 2001-10-05 PRIOR APPLICATION NUMBER: 60/279,526 PRIOR PILING DATE: 2000-10-06 PRIOR FILING DATE: 2001-03-27 PRIOR FILING DATE: 2001-03-27 NUMBER OF SEQ ID NOS: 8481 SOFTWARE: FastSEQ for Windows Version 4.0 SEQ ID NO 2632 LENGTH: 4557 TYPE: DNA ORGANISM: Bacillus licheniformis US-09-974-300-2632	Alignment Scores:

q	691 GAA	GAAGTAACGCTT 702
٥y	81 Glu	uValLeuAspLysGluGlnThrGlyPheLeuAlaGluGluAlaProAspAsnValLys 100
qa	702	702
Ολ	101 Thr	ThrMetLeuArgSerLysGlyTyrPheSerSerLysValSerLeuThrGluLysAsp 119
qu	703	1 1
Qy	120 Gly	GlyAlaTyrThrValHisIleThrProGlyProArgThr
qq	742 GGA	ACTITICGATAAAGGCATCAACCCGGGCAGGTCACATGGACAGTCGACCTCAACAAA 801
ογ	133	137 137 137 137 137 137 137 137 137 137
QQ	802 AAA	FTGGAT
ογ	138	
qq	862 TCT	AGTTTATCAGCTGGATGTCAACATAGATGGTTCAGTCAGCCGC
Οy	141 Ile	IleLeu
qq	922 GTT	CTTTCAGGCTACACCGTAGACGCAGATGGAAATGTCACATTCGACGGTGAGATAGAT
Οy	153 Glu	GluTyrTyrArg 156
QQ	982 TCG	GCTTACCGCCTCATCTATGTGACGGACATCGATGACTCCGCAAAACCGAACGAA
οy	157	AsnalaLeuGluAsnTrpGlnGlnProValGlySerAspPheAspGlnAspSer 174
qq	1042 GGA	GGAAACGCTGCATTTAGGAACAAGGCAACGTTCGGCGGAGACAATCTGGAACCGGCTTCT 1101
δλ	175 Trp	TrpGluAsnSerLysThrSerValLeuGlyAlaValThrArgLys 189
đ	1102 GCA	GAGGCCTCTGTCACGGCCAAATACGGGAAAATGATCGAAAAATGGTCGACAGGTTAT 1161
ΟŸ	190	GlyTyrProLeuAlaLysLeu 196
qq	1162 AAA	AAAAGCGATTCACAGACGTTCAGCTGGACGATTTTATATAAACTATGGAGAGAAAAATC 1221
οy	197 Gly	GlyAsnThrArgAlaAlaValAsnProAspThrAlaThrValAspLeuAsnValValVal 216
qq	1222 GAC	GAATCCAAAGCGAGCATAACAGACTCGTTTGGTTCCGCTGATTTGCATCTTGTTTCA 1281
Qy	217 Asp	AspSer
q	1282 GAT	actttcaatcag
δλ	221 Pro	ollealaPheGlyAspPheGluIleThrGlyThrGlnArgTyr 235
q	1342 CCTC	TAACGGAAGCAAGGATTATACGCT
οy	236 Pro	ProGluGlnIleValSerGlyLeuAlaArgPheGlnProGlyThrProTyrAspLeuAsp 255
qq	1402 TTT	raaccaagatgttaccggagcttacaaatcacgtatcaaaccgaggtcaacagcgga 1461
Οy	256 Leu	GlnAla
qa	1462 GTA	GTAATCATCGATAAATCAACAACCTATACGAACACTGCAGG 1503
Qy	276 Gln	PheAspArgLe
q	1504	ACCGGAACAGAGAATCAAAGAAAGTTCAGGTACAGC 1542
Oy	296 Val	LysArgHisLysLeuGluThrGlyIleArgLeuAspSerGluTyrGlyLeuGlyGly 315
qa	1543 GTT	GTTCAGCAGAATTGATAAAAGGCTACTCAAACATTGATTACAAG1587
Οy	316 Lys	SIleAlaTyrAspTyrTyrAsnLeuPheAsnLysGlyTyrIleGlySerValValTrp 335

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TITLE OF INVENTION: Enterococcus faecialis Polynucleotides and Polypeptides NUMBER OF SEQUENCES; 982 CORRESPONDENCE ADDRESS:
1588 AAGAAAACGGTCGATTGGACGATCGCAATCAACAAAACAACTACACGATGAACAATTGG 1647
                                                           ::: ||| :::|||:::
1648 AAGTIGGAIGACAATITCGAAAGCGGGGGGCTCACGCTCCTCGACGATCATICCGCCTT 1707
                                                                                                                                  1708 CAGGATGTGACGAATAACAAAACGCTTGAAGAAGGCAAAGACTATACATTGATAATAAAA 1767
                                                                                                                                                                                                     1768 CCGGATCATGAAGGTTTTCTCCTGGAACTCATCGGAGATTATGCGACAACGAACAGCCAG 1827
                                                                                                                                                                                                                                                                            1888 ACGCCAGAATCA-----ACGTGG-----ACTGATCACAGCAGCACTGAACGCAAAAAT 1935
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                                                                                                                                                                                                                                                                                                                           376 ArgAlaPheSerGlyGlyIleTrpTyrValArgAspArg-AlaGlyIleAspAlaArgLe 395
                                                                                                                                                                                                                                                                                                                                                                                                395 u-GlyAlaGlu---PheLeuAlaGluGlyArgLysIleProGlySerAspIleAspLeuG 414
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                                                                                                                                                                                    -----GlyAsnTyrTrpThrSerAsn-----
                                                                                                                                                                                                                                                      -----ValSerTyrAsnArgSer-----ThrThrGlnAsnLeuGluLys
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         554 Phe---HisaspMetGlyaspalaalaalaasnPheLysArgMetLysLeuLysHisGly
                                   336 AspMet---AspLysTyrGluThr-----ThrLeuAlaAlaGly-----
                                                                                                        1936 AAGGAAGCGAGCAGTTTTACGCCGAATCGCCAGACATCCCA-----
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  978 AACGCCTTCAAACACGCCTTATACAACGCTGTTTCAAAAGAAAT---
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Patent No. US20020120116A1
GENERAL INFORMATION:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           APPLICANT: Charles A. Kunsch
Patrick J. Dillon
Steven Barash
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           ProAspThrGluSerValLys---LeuLysProLysPheProValArgIleAspThrGln 60
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        2574 AGTAAAAACCCACGCTCAACGCTGGGGACGGTCACAGAAATCAATGATTATTTACGATTG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 2634 TTATTTGCTCGGGTAGGTCATCCAATTTGTCCTAACGATCATATTGAAATTACCAGTCAG
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                                                                                                                      MEDIUM TYPE: Diskette, 3.50 inch, 1.4Mb storage COMPUTER: HP Vectra 486/33 OPERATUR SYSTEM, MSDOS version 6.2 SOFTWARE: ASCII Text
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           5480
145
88
333
369
38
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Mismatches:
Indels:
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 Human Genome Sciences, Inc.
10 Key West Avenue
                                                                                                                                                                                        CURRENT APPLICATION DATA:

APPLICATION NUMBER: US/09/070,927A
FILLING DATE: 04-May-2000
CLASSIFICATION: <unknown>
PRIOR APPLICATION DATA:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Length:
Matches:
                                                                                                                                                                                                                                                                             APPLICATION NUMBER: 60/046,655
FILING DATE: 1997-05-16
APPLICATION NUMBER: 60/044,031
FILING DATE: 1997-05-06
APPLICATION NUMBER: 60/066,009
FILING DATE: 1997-11-14
ATTORNEY/AGENT INPORMATION:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              112 LysValSerLeuThrGluLysAspGly------
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  SEQUENCE DESCRIPTION: SEQ ID NO: 132;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   2694 TCTGTTGAACAGATGGTTGATAAA------
                                                                                                                                                                                                                                                                                                                                                                                                    NAME: Kenley K. Hoover
REGISTRATION NUMBER: 40,302
                                                                                                                                                                                                                                                                                                                                                                                                                                          REFERENCE/DOCKET NUMBER: TELECOMMUNICATION INFORMATION:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                             (301) 309-8504
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          ELEFAX: (301) 309-8512
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                LENGTH: 5480 base pairs
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            INFORMATION FOR SEQ ID NO: 132: SEQUENCE CHARACTERISTICS:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 TYPE: nucleic acid
STRANDEDNESS: double
                                                                              ZIP: 20850
COMPUTER READABLE FORM:
ADDRESSEE: Human G
STREET: 9410 Key W
CITY: Rockville
STATE: Maryland
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30.068
18.718
3.268
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                                                                     COUNTRY: USA
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Percent Similarity:
Best Local Similarity:
Query Match:
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Db 3813TCAGGCGTTCTTTACATTTTAGATGAACCATCAATTGGTTTGCATCAA 38	Qy 394 ArgLeuGlyAlaGluPheLeuAlaGluGlyArgLySIleProGlySerAspIleAspLeu 413	Oy 414 GlyAsnSerHisAlaThrMetLeuThrAlaSerTrpLysArgGloLeuLeuAsnAsnVal 433	434 LeuHisProGluAsnGlyHisTyrLeuAspGlyLysIleGlyThrThrLeuGlyThrPhe	Oy 454 LeuSerSerThralaLeuIleArqThrSerAlaArqAlaGlyTyrPhe469	3951 ATGGCTTCGGATTACTTGATTGATGTGGGACCTGGCGCTGGACATCTGGGCGGTGAAATT	Oy 470PheThrProGluAsnLysLysLeuGlyThrPheIleIleArgGlyGlnAla 486	Oy 487 GlyTyrThrValAlaArgAspAsnAlaAspValProSerGlyLeuMetPheArgSerGly 506	Oy 507 GlyalaserSerValArgGlyTyrGluLeuAspSerIle519	Qy 520	Oy 531 GluhrgalaleuLeu	Db 4305 AAACACAAAAGCATCACTGGTTATGAAGCCATTGAAAAGATTGTTGACATTGACCAAAGT 4364	Qy 536ValGlySerLeuGluTyrGlnLeuProPheThrArgThrLeuSerGlyAlaValPhe 554 ::	Oy 555 HisaspMetGlyAspalaAlaAsnPheLysArgMetLysLeuLysHisGlySerGly 574	Qy 575 LeuGlyValArgTrpPheSerProLeualaProPheSerPheAsp11ealaTyrGlyHis 594	Oy 595 SerAspLys	യഗ	; GENERAL INFORMATION: ; APPLICANT: Berka, Randy M. ; APPLICANT: Clausen, Ib Groth ; TITLE OF INVENTION: Methods For Monitoring Multiple Gene	; TITLE OF INVENTION: Expression ; FILE REFERENCE: 10085.500-US ; CURRENT APPLICATION NUMBER: US/09/974,300 ; CURRENT FILING DATE: 2001-10-05
2856 GATGTTAGTGAGGCACCAGAACTTGAAAAAAAAAAAAAA	142 LeuGlyAspIleLeuSerAspGly149 :::!!  :::!   :::     :::     :::     :::     :::     :::     :::     :::     :::     :::     :::     :::     :::     :::     :::     :::     :::     :::     :::     :::     :::     :::     :::     :::     :::     :::     :::     :::     :::     :::     :::     :::     :::     :::     :::     :::     :::     :::     :::     :::     :::     :::     :::     :::     :::     :::     :::     :::     :::     :::     :::     :::     :::     :::     :::     :::     :::     :::     :::     :::     :::     :::     :::     :::     :::     :::     :::     :::     :::     :::     :::     :::     :::     :::     :::     :::     :::     :::     :::     :::     :::     :::     :::     :::     :::     :::     :::     :::     :::     :::     :::     :::     :::     :::     :::     :::     :::     :::     :::     :::     :::     :::     :::     :::     :::     :::     :::     :::     :::     :::     :::     :::     :::     :::     :::     :::     :::     :::     :::     :::     :::     :::     :::     :::     :::     :::     :::     :::     :::     :::     :::     :::     :::     :::     :::     :::     :::     :::     :::     :::     :::     :::     :::     :::     :::     :::     :::     :::     :::     :::     :::     :::     :::     :::     :::     :::     :::     :::     :::     :::     :::     :::     :::     :::     :::     :::     :::     :::     :::     :::     :::     :::     :::     :::     :::     :::     :::     :::     :::     :::     :::     :::     :::     :::     :::     :::     :::     :::     :::     :::     :::     :::     :::     :::     :::     :::     :::     :::     :::     :::     :::     :::     :::     :::     :::     :::     :::     :::     :::     :::     :::     :::     :::     :::     :::     :::     :::     :::     :::     :::     :::     :::     :::     :::     :::     :::     :::     :::     :::     :::     :::     :::     :::     :::     :::     :::     :::     :::     :::     :::     :::     :::     :::   ::     :::     :::     :::     :::     :::     :::		laLeu	3036 AGTGAACATTATGCTTGTCCTTATTGTGGGTTCACAGTCGGTGAATTGGAACCGCGCTTG 3095	160 GluasnTrpGlnGlnProValGlySerAspPheAspGlnAspSerTrpGluAsnSerLys 179 ::::::	ysLeuGlyAsnThr 	ArgalaalaValAsnProAspThrAlaThrValAspLeuAsnValValValValSpSer:::	luGln::	Company   Comp	yrSer	- 1	SerValThrGluValLysArgHisLysLegCuGluThr		310 GluTyrGlyLeuGlyGlyLysIlealaTyrAspTyrTyrAsnLeuPheAsnLysGlyTyr 329  1.:	- Trpasp - T	MetAspLysTyrGluThrThrLeuAlaAlaGlyIleSerGlnPro	352ArgasnryrargGlyasnryrrrprhr	361SerAsnValSerTyrAsnArgSerThrThrGlnAsnLeuGluLys 375 

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---ArgSerLysGlyTyrPheSerSerLysValSerLeuThrGluLysAspGlyAlaTyr 122
                                                                                                                                                                                                                                                                                                                                                                                  ThrValHis------IleThrProGlyProArgThrLysIleAlaAsnValGly 138
                                                                                                                                                                                                                                                                                                                                                                                                                                               ValAlaIleLeuGlyAspIleLeuSerAspGlyAsnLeuAlaGluTyrTyrArgAsnAla 158
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     GTTGCGATCTGCAAAGAGAACGATATTGACTTTCTTTTGGCAGTCGGCGGGGGGAAGCGTC 300
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    357
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                                                                                                                                                                                                                                                                                                    LeuAlaGluGluAlaProAspAsnValLysThrMetLeu------------------103
                                                                                                                                                                                                                                                                                                                                CTGGCAGAAGAGGTGAAACAATACGGCCGCAATGTCCTGCTCGTATACGGCGGAGGCAGC 123
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     LeuGluAsnTrpGlnGln---ProValGlySerAspPheAspGlnAspSerTrpGluAsn 177
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   SerLysThrSerValLeuGlyAlaValThrArgLysGlyTyrPro------ 192
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              -------ATTGTGACGAAAAACATATTCCGGCTGATGCGCTGCCG 396
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     GluileThrGlyThrGlnArgTyrProGluGlnIleValSerGlyLeuAlaArgPheGln 247
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 ProGlyThrProTyrAspLeu-AspLeuLeuLeuAspPheGlnGlnAlaLeuGluGlnAs 267
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      gLeuAspSerGluTyrGlyLeuGlyGlyLysIleAlaTyrAspTyrTyrAsnLeuPheAs 326
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  ATTGATTGTACGAAAGCAATTGCTGCCGGAGCGAAATACGACGGCGATGCGTGGGAT---
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HRIOR FILING DATE: 2001-03-27
NUMBER OF SEQ ID NOS: 8481
SEQ TON 28
LENGTH: 1164
TYPE: DA
ORGANISM: Bacillus licheniformis
US-09-974-300-28
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APPLICANT: Kreps, Joe1
APPLICANT: Kreps, Joe1
APPLICANT: Kreps, Joe1
APPLICANT: Kreps, Joe1
APPLICANT: Aun, Ton9
TITLE OF INVENTION: STRESS-REGULATED GENES OF PLA
TITLE OF INVENTION: SAME, AND METHODS OF USE
FILE REFERENCE: SCRIP1300-3
CURRENT APPLICATION NUMBER: US/09/938,842A
CURRENT FILING DATE: 2001-08-24
PRIOR APPLICATION NUMBER: US 60/227,866
PRIOR APPLICATION NUMBER: US 60/227,866
PRIOR FILING DATE: 2001-01-16
SEQ ID NOS: 5379
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US-09-938-842A-2606
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Best Local Similarity:
Query Match:
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FILE REFERENCE: PB324D1
CURRENT APPLICATION NUMBER: US/09/956,004
CURRENT FILING DATE: 2001-09-20
PRIOR PILING DATE: 1997-11-21
PRIOR PILING DATE: 1997-11-4
PRIOR PILING DATE: 1997-10-14
PRIOR PILING DATE: 1997-10-14
PRIOR PILING DATE: 1997-10-14
PRIOR PILING DATE: 1997-11-22
NUMBER OF SEQ ID NOS: 142
SOFTWARE: PatentIn version 3.1
SEQ ID NO 14
                                                                                                                                                                                                                                                   TYPE: DNA ORGANISM: Escherichia coli
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11323 CTCCTCCCCTGCCTTTGCATTCTTTCATTTTCGTCTCCGGCAGCCATGCTGTCTCCGGGT 11382
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FEATURE:

NAME/KEY: misc_feature

LOCATION: (19750)..(19750)

OTHER INFORMATION: n equals a,

NAME/KEY: misc_feature

LOCATION: (20174)..(20174)

US-09-956-004-14
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20.84%
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Best Local Similarity:
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ογ		LeuAlaGluTyrTyrArgAsnAlaLeuGluAsnTrpGlnGlnProValGlySerAspPhe 170 ::: ::	qa
9	11856 ATGGA	ATGGAGCAGATTAATCGTCTGCGTACGGAGCCGGTACAGATTGAAATATCGCCCGGT 11912	ò
å å	171 AspG1		 48
3 6		TOO IN THE	Qy
8 3	11958 TGGCC	TYFFFOLEUALBLYSLEUGLYASNTNFAFGALBALIVALASNPFOASSTNFALBThIVAL 210   :::   :::   :::  TGGCCTGTQACAGGGAGCGTGGGCAFCGACACAGCGGAAGAATACCGGTACGGG 12017	qa —
2			RESUI
g 5	211 ASPLE 	AspicuasnyalvalvalsapSerGiyArgProllAlaPheGlyAspPheGluIleThr 230 	US-09
à	231 GlyTh	GlyThrGlnArgTyrProGluGlnIleValSerGlyLeuAlaArgPheGlnProGly 249	; GE
g	12078 AGCGG		
ογ	250 Thr	ProTyrAspLeuAspLeuLeuLeuAspPheGlnGlnAlaLeuGluGlnAsn 267	
Q	12138 GTCAG	GTCAGTCTGCCGTATGGCTATACCCTGGTGGATTACACG	
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2	171//	TATTCATGGAGTGACTACCTCAGCACCATTGATAACCGGGGCTGGCGGTGGCGT 12230	
දු පු	282 LeuGl 12231 TCCAC	LeuGinGlyAspArgValProValLysValSerValThrGluValLysArgHis 299	
ογ	300 LysLe		
g	12291 GACAT	GACATGAAGACAGCACTGACCGGAGGTCTGCAGCACCGCATTATTCAC 12338	
9. O	320 ASPTY :::11 12339 AATTA	320 AspTyrTyrAsnLeuPheAsnLysGlyTyrIleGlySerValValTrpAspMetAspLys 339 :::111 ::: 12339 AATTATCTGGATCATGTTCTGCTTCAGGGCAGCAGCT 12377	
ò	340 TyrG1	TyrGluThrThrLeuAlaAlaGly1leSerGlnProArgAsnTyrArgGlyAsnTyrTrp 359	
Op	12378 AAACT	AAACTCACTTCATTTTCTGTCGGGCTGAATCACACACACA	
ογ	360 Thrse	ThrSerAsnValSerTyrAsnArgSerThrThrGlnAsnLeuGluLysArgAlaPheSer 379	
q	12438 ACACT	ACACTGAATCCGGTATTCACACGG 12461	SEC
oy og	380 GlyGl         12462 GGGAT	GlyGlyIleTrpTyrValArgAspArgAlaGlyIleAspAlaArgLeuGlyAlaGluPhe 399 	
ò	400 LeuAl	LysilePro	50-SD
qq	12486 AGCGA		Align
ογ	420 MetLe	MetLeuThralaSerTrpLysArgGlnLeuLeuAsnAsnValLeuHisProGluAsnGly 439	Pred. Score
Q	12537 TCGGT	GAGTGCCAGTTTCAGCGCCCCGTCACGGACAGGGTGTGGTGG 12584	Best
ò	440 HisTy	HisTyrLeuAspGlyLysIleGlyThrThrLeuGlyThrPheLeuSerSerThrAlaLeu 459	. ego
đ	12584	12584	50-SN
ογ	460 IleAr	IleargThrSeralaargAlaGlyTyrPhePheThrProGluAsnLysLysLeuGlyThr 479 	δλ
Op	12585CT	CTGACCAGCGCTTATGCCCCAGTGGTCACCGGACCGT 12620	අධ
δ	480 Pheil	PhelleIleArgGlyGlnAlaGlyTyrThrValAlaArgAspAsnAlaAspValProSer 499	Q
q	12621	CTTCATGGTGTGGAACAACTGAGCCTC	qa

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520 GlyLeuAlaGlyProAsnGlySerValLeuProGluArgAlaLeuLeuValGlySerLeu 539
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500 GlyLeuMetPheArgSerGlyGlyAlaSerSerValArgGlyTyrGluLeuAspSerIle 519
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                                                                                                                                                                                                                                                                                     540 GluTyrGlnLeuProPheThrArgThrLeuSerGlyAlaValPheH1sAspMetGly 558
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OTHER INFORMATION: Genbank Accession No. US20020119462A1 X59601
99-917-800A-1505
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US-09-917-800A-1505
Sequence 1505, Application US/09917800A
Patent No. US20020119462A1
GENERAL INFORMATION:
APPLICANT: Mendrick, Donna
APPLICANT: Dohnson, Kory
APPLICANT: Castle, Arthur
APPLICANT: Elashoff, Michael
APPLICANT: Elashoff, Michael
APPLICANT: Elashoff, Michael
APPLICANT: Gene Logic, Inc.
TITLE OF INVERNION: Molecular Toxicology Modeling
TITLE OF INVERNION: Molecular Toxicology Modeling
FILER REFERENCE: 44921-5038-US
CURRENT APPLICATION NUMBER: US 60/222,040
PRIOR PILING DATE: 2000-07-31
PRIOR APPLICATION NUMBER: US 60/222,040
PRIOR PLING DATE: 2000-07-31
PRIOR PLING DATE: 2001-05-15
PRIOR PALICATION NUMBER: US 60/290,645
PRIOR PALICATION NUMBER: US 60/290,645
PRIOR PALICATION NUMBER: US 60/290,747
PRIOR APPLICATION NUMBER: US 60/292,336
PRIOR PALICATION NUMBER: US 60/292,336
PRIOR PLING DATE: 2001-05-15
PRIOR PALICATION NUMBER: US 60/292,336
PRIOR FILING DATE: 2001-06-19
PRIOR FILING DATE: 2001-06-19
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TYPE: DNA
ORGANISM: Rattus norvegicus
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; ORGANISM: Chlamydia
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                             -----ACCAAGGGCTTCTTCGACCCAAAC-----ACCGAGGAGAACCTCACATAC 12723
                                                                                                                                                       12784 AAGGAAAGGGGGGGGGGGGGAAGACGTCCTCCAAGTCCTCAGTGCGCAAGCGCCGCGTG 12843
                                                                                                                                                                                                                 12844 GTGATTGTGGACCCTGAGACGGCCAAGGAGATGTCAGTGTATGAGGCCTACCGCAAGGGC 12903
                                                                                                                                                                                                                                                                       |||| ::: |||| ::: |||| | :: ||||||| | CTCATAGACAGGAGTGCGAGTGGGAAGAAATC 12963
                                                                                                                                                                                                                                                                                                                                             12964 ACCATCTTCCTCGGACGCGTCGTCAAATCTATGATCATCGACCGCCGCTCTGGCCGC 13023
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                                                                                          12724 CTGCAGCTGATGGAGCGCTGTATCACTGACCCCCAGACTGGCCTGTGTCTCCTGCCGCTG 12783
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                                                                                                                                                                                  ValAlaIleLeuGlyAspIleLeuSerAspGlyAsnLeuAlaGluTyrTyrArgAsnAla 158
                                                                                                                                                                                                                                              LeuGluAsnTrpGlnGlnProValGlySerAspPheAspGlnAspSerTrpGluAsnSer 178
                                                                                                                                                                                                                                                                                                                                                                                                                                      206 AspThrAla---ThrValAspLeuAsnValValValAsp-----SerGlyArgProlle 222
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    223 AlaPhe-----GlyAspPheGluIleThrGlyThrGlnArgTyrProGluGlnIleVal 240
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 SerGlyLeuAlaArgPheGlnProGlyThrProTyrAspLeuAspLeuLeuLeuAspPhe 260
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              261 GlnGlnAlaLeuGluGlnAsnGlyHisTyrSerGlyAlaSerValGlnAlaAspPheAsp 280
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          281 ArgLeuGlnGlyAspArgValProValLysValSerValThrGluValLysArgHisLys 300
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 LeuArgSerLysGlyTyrPheSerSerLysValSerLeuThrGluLysAspGlyAlaTyr 122
                                                          -----ThrValHisIleThrProGlyProArgThrLysIleAlaAsnValGly--- 138
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       390 GlylleAspAlaArgLeuGlyAlaGluPhe....----LeuAlaGluGlyArg 404
                                                                                                                                                                                                                                                                                                                                                                             ...------GlyTyrProLeuAlaLysLeuGlyAsnThrArgAlaAlaValAsnPro
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GAGGAGGCCACAGGGCTGAGGCTGCTGGAAGCCGCGCCACAGTCCAGCAAGGGCTACTAC 13845 13726 ACGTGCCCCAAGACCAAGCTCAAGATCTCTTACAAGGACGCTCTGGATCGGAGCATGGTG 13785 1063 GTTGCTAACTGTGGCCCTGTACAATTTTTAAGGAATATCGCTAATGATGGTGGAGCGATT 1122 Ser-----GlyLeuMetPheArgSerGlyGlyAlaSerSerValArgGlyTyrGlu 515 ......LeuGlyAspIleLeuSerAsp 148 422 ThralaSerTrpLysArgGlnLeuLeuAsnAsnValLeuHisProGluAsnGlyHisTyr 441 442 LeuAspGlyLysIle-----GlyThrThrLeuGlyThrPheLeuSerSerThrAla 458 479 ThrPheIleIleArgGlyGlnAlaGlyTyrThrValAlaArgAspAsnAlaAspValPro 498 ---ArgThrLysIleAlaAsnValGlyValAlaIle 141 108 TyrPheSerSerLysValSerLeuThrGluLysAspGlyAlaTyrThrValHisIleThr 127 LeulleArgThrSerAlaArgAlaGlyTyrPhePheThrProGluAsnLysLeuGly ; Sequence 170, Application US/09841132
; Patent No. US20020061848A1
; GENERAL INFORMATION:
; APPLICANT: Bhatia, Ajay
; APPLICANT: Skeiky, Yasir A.W.; APPLICANT: Probst, Peter
; TITLE OF INVENTION: COMPOSITIONS AND METHODS FOR TREATMENT AND
; TITLE OF INVENTION: DIAGNOSIS OF CHLAMYDIAL INFECTION
; FILE REFERENCE: 210121,4699,841,132
; CURRENT APPLICATION NUMBER: US/09/841,132
; CURRENT FILING DATE: 2001-04-23
; NUMBER OF SEQ ID NOS: 599
; SOFTWARE: FRASISEQ for Windows Version 3.0/4.0 2949 133 70 237 178 32 Length:
Matches:
Conservative:
Mismatches:
Indels: Lys1leProGlySerAsp1leAspLeuGlyAsnSerHisAla. US-09-857-669-2 (1-609) x US-09-841-132-170 (1-2949)

0y 4	Db 22:	Qy 4:	Db 22	Oy 4,	Db 23	Oy 4(	Db 239	Oy 48	Db 24	Oy 5(	N	оу 5.	Db 249	Qy 54	Db 254	φy 5(	Db 26(	0y 57	Db 266	RESULT US-09-84	Sequer	GENERA APPLI	APPL	TITLE	CURRE	NUMBE SOFTW SEQ II	TYPE	; ORG# US-09-84	Alignmer Pred. No	Score: Percent	Best Loc Query Ma DB:	38-60-SD	0y 10
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230 TTTGGATCATCGATGTTTGGTCTAGCATTTACCGAAGTATTTGGTAGATCTAAAGATTAT 2289
                                                                                                                               149 --- AGCGATGTTCGT-----TGGGATAATAACTGTCTGGCTGGAGAATTGGAGCG 2496
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| CCTTTCGTGCAAGCTGAGTTTTCTTATGCCGATCATGAATCTTTTACAGAGGAAGGCGAT 2607
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                                                                                      433 ValLeuHisProGluAsnGlyHisTyrLeuAspGlyLysIle------Gly 447
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413 LeuGlyAsnSerHisAlaThrMetLeuThrAlaSerTrpLysArgGlnLeuLeuAsnAsn 432
                                                                                                                                                                                448 ThrThrLeuGlyThrPheLeuSerSerThrAlaLeuIleArgThrSerAlaArgAlaGly 467
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Sequence 182, Application US/09841132
Sequence 182, Application US/09841132
Select No. US2002061848a1
Select No. US2002061848a1
Select No. US2002061848a1
Septicant: Skeiky, Yasir A.W.
APPLICANT: Skeiky, Yasir A.W.
APPLICANT: Probat, Peter
TITLE OF INVENTION: DIAGNOSIS OF CHLAMYDIAL INFECTION
TITLE OF INVENTION: DIAGNOSIS OF CHLAMYDIAL INFECTION
TITLE OF INVENTION: DIAGNOSIS OF CHLAMYDIAL INFECTION
CURRENT APPLICATION NUMBER: 2001-04-23
SOFTRENT FILING DATE: 2001-04-23
SOFTWARE: FastSEQ for Windows Version 3.0/4.0
SEQ ID NO 182
LENGTH: 3021
TENGTH: 3021
TENGTH: 3021
TYPE: DNA
ORGANISM: Chlamydia
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Mismatches:
Indels:
Gaps:
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Matches:
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Watch:
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Sequence 527, Application US/09070927A
Patent No. US20020120116A1
GENERAL INFORMATION:
GENERAL INFORMATION:
APPLICANT: Charles A. Kunsch
Patrick J. Dillon
Steven Barash
TITLE OF INVENTION: Enterococcus faecialis Polynucleotides and Polypeptides
NUMBER OF SEQUENCE: 982
CORRESPONDENCE ADDRESS:
ADDRESSE: Human Genome Sciences, Inc.
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                                     2191 CGAGGATTATGGGTTTCTGGAGTTTCGAATTTCTTCTATCATGACCGCGATGCTTTAGGT 2250
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                                                                             393 AlaArgLeuGlyAlaGluPheLeuAlaGluGlyArgLysIleProGlySerAspIleAsp 412
                                                                                                                                                            LeuGlyAsnSerHisAlaThrMetLeuThrAlaSerTrpLysArgGlnLeuLeuAsnAsn 432
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  -- TyrvalArgAspArgAlaGlylleAsp 392
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COMPUTER READABLE FORM:
MEDIUM TYPE: Diskette, 3.50 inch, 1.4Mb storage
COMPUTER: HP Vectra 486/33
OPERATING SYSTEM: MSDOS Version 6.2
SOFTWATNE: ASCII Text
CURRENT APPLICATION DATA:
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STATE: Maryland
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  GlyGlyIleTrp
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2411 ACGAAATGGATTGAAAAAAGAGATAGTAATCCACAGGAACCTATAACTATTAATTCTGGA 2470
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2771 GGAACCAACTACACAATGCTGATTCTGATGGTGAAAAAAGTGACGGATTTGAAATT 2830
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Matches:
Conservative:
Mismatches:
Indels:
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                                                        APPLICATION NUMBER: 00,0440,033
FILING DATE: 1997-05-16
FILING DATE: 1997-05-06
FILING DATE: 1997-05-06
FILING DATE: 1997-05-06
APPLICATION NUMBER: 60/066,009
FILING DATE: 1997-11-14
ATTOREY/AGENT INFORMATION:
NAME: Kenley K. Hoover
REGISTRATION NUMBER: 40,302
REGISTRATION NUMBER: 99369
TELEPHONE: (301) 309-8514
INFORMATION FOR SEQ ID NO: 527:
SEQUENCE CHARACTERISTICS:
LENGTH: 7107 base pairs
                                                                                                                                                                                                                                                                                                                                                         TOPOLOGY: 11near
SEQUENCE DESCRIPTION: SEQ ID NO: 527:
                               PRIOR APPLICATION DATA:
APPLICATION NUMBER: 60/046,655
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Gaps:
FILING DATE: 04-May-2000
CLASSIFICATION: <Unknown>
                                                                                                                                                                                                                                                                                                                          TYPE: nucleic acid
STRANDEDNESS: double
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Best Local Similarity:
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g	2831 TTTAATGATACTGATCCT	TTGGTGAGTCCGTACGATTGGTTTGATAAAAT	2881
οy	180 ThrSe	GlyTyrProLeuAlaLysLeuGlyAsn	6
qq	2882 GGAGAAAAATAA	ACTGATACGATAAGTGGAAGAATAGGAAAT	6
QY	199 ThrArgAlaAlaVal		213
qq	2942 AAC	AGAACTGTTCAATTAATA	2989
0y	214 ValValValAspSer		224
qa	2990 AAGGTTACTGATAACGG	AAAA	3049
δ	225 GlyAspPheGluIleThr	og I u	237
Dp	3050 GGGACTTTTGAATTTACT	AAATTAAGCAAGGAGATAGACTCGTTGTT	3109
ò	238 GlnIleValSerGlyLeuAl	uren 2	257
QQ	3110 AAATTATTACTAAT	GAAGTACAAAGAGAA	3139
ò	258 LeuAspPheClnGlnAla		569
qq	3140 ATTGATCGACAAAGAAAT	AGAGGTATCTGAAGAA	3199
οy	270TyrserGlyAla		284
qq	3200 GTAATTGTTCAGGGCGCA	AATTGTTCAGGCGCACAAGTAACAGTCTCTTTTGACTTATAATTATAAACCAGT 3	3259
οy	285AspArgVal	sLysLeu	301
qq	3260 CCTGACTTTGACCGTCAA	3	3307
Qy	302 GluThrGlyIleArgLeu	rAspTyr 3	321
QQ	3308	3	3331
ΟŸ	322 TyrAsnLeuPheAsnLys	m	339
qq	3332 TTTACTCCAGAACGAAAA	TGGATACTGATAAA 3	3382
οy	340 TyrGluThrThrLeuAla	33	359
QQ	3383		3406
٥y	360 ThrSerAsnValSerTyr	3	377
qa	3407GATGGTTCTAGTTTT	   AACGGTATTTGCTCAATGGGAAAAAAAAGAACCT 3	3463
Οy	378 PheSerGlyGlyIleTrpTyrValArgAs	pargalaGlyIleAspAlaArgLeuGlyAla 3	397
qq	3464 AACCTAGCTGGA	:::	3499
οy	398 GluPheLeuAlaGluGly	4	116
qa	3500ATTGAAGAAGGT	:::	553
0y	417 HisAlaThrMetLeuThr	4	136
qa	3554 GGGTCTGTAATTGTAACT	:: :::::    CTGTAATTGTAACTGGAGAACTTCCAAAAGGGCTCTTTGGGTTATCTATAAAT 3	9610
δλ	rLe	pGlyLysIleGlyThrThrLeuGlyThrPheLeuSerSer 4	951
QQ	3611	.::	3646
ΟŊ	457 ThrAlaLeuIleArgThr	4	941
qq	3647 GACTGGATTGATGGAGAA	TILL THE	682
ογ	477 LeuGlyThrPheileileArgGlyGlnAl	aGlyTyrThrValAlaArgAspAsnAlaAsp 4	961
Dp	3683 ATTCCAGTTACAATTAGT	GAA 3	3727

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49/ Valfosetolfytyfelwetrheafseftytytyfalasefsefydafafgilyfyfelluleu 	3784 Db	69GUILETINGIN 77   1:1     1:1     1:1     337   TRATTTGCTCGGGTAGGTCATTTGTCCTAACGATCATATTGAAATTACCAGTCAG 396
517 AspSerIleGlyLeuAlaGly	528 QY 3841 Db	78 GlnGlnGluGluValLeuAspLysGluGlnThrGlyPheLeuAlaGluGluAlaProAsp 97
529 LeuproGluargalaLeuLeuValGlySerLeu 539 		AsnValLysThrMetLeuArgSerLysGlyTyrPheSerSer
RESULT 32 US-09-815-242-6700 : Sequence 6700, Application US/09815242 : Datent No. HS20030061560a1	Qy	112 LysValSerLeuThrGluLysAspGly
GENERAL INFORMATION: APPLICANT: Haselbeck, Robert APPLICANT: Ohlsen, Rari L.	Oy Oy	123 ThrValHisIleThrPro 128 
	QY	129
APPLICANT: Talmanuco, MODELL 1. APPLICANT: XU, H HOWARD TITLE OF INVENTION: Identification of Essential Genes in TITLE OF INVENTION: Prokaryotes	Oy Db	137ValGlyValAlaIleLeuGlyAspIleLeuSerAspGlyAsnLeu 151
CIRLE AFFERENCE: ELLIRA.UILA CURRENT APPLICATION NUMBER: US/09/815,242 CURRENT FILING DATE: 2001-03-21 PRIOR APPLICATION NUMBER: 00/191,078	dQ dQ	152 AlaGluTyrTyr
FILING DATE: 2000-03-21  PPLING DATE: 2000-05-23  APPLICATION NUMBER: 60/207,727	da · · · · · · · · · · · · · · · · · · ·	160 GluAsnTrpGlnGlnProValGlySerAspPheAspGlnAspSerTrpGluAsnSerLys 179 ::::::
FILING DATE: 2000-03-26 APPLICATION NUMBER: 60/242,578 APPLICATION NUMBER: 60/253,625	Qy	180 ThrSerValLeuGlyAlaValThrArgLysGlyTyrProLeuAlaLysLeuGlyAsnThr 199           844TTAGGT
FILING DATE: 2000-11-2/ APPLICATION NUMBER: 60/257,931 APPLICATION NUMBER: 60/269,308	do do	200 ArgalaalavalAsnProAspThrAlaThrValAspLeuAsnValValValAspSer 218 ::
WINDER FULLS DATE: 2001-02-16 NUMBER OF SEQ ID NOS: 14410 SOFTWARE: FastSEQ for Windows Version 4.0 TOWNS TO THE TOWN TOWNS TO THE TOWN TOWNS TO THE TOWN TOWNS TO THE TOWN TOWNS TO THE TOWN TOWNS TO THE TOWNS TOWNS TOWNS TOWNS TOWNS TOWNS TOWNS TOWNS T	AQ Db	219 GlyArgProIleAlaPheGlyAspPheGluIleThrGlyThrGlnArgTyrProGluGln 238
TYPE: DNA ORGANISM: Enterococcus faecalis	qq Ko	239 IleValSerGlyLeuAlaArgPheGlnProGlyThrProTyrAspLeuAspLeu 256 ::
; NAME/AET: CUS ; LOCATION: (1)(2820) US-09-815-242-6700	ko da .	257 LeuLeuAspPheGlnGlnalaLeu
	QY	272 GlyalaservalGinalaaspPheaspargLeuGinGlyaspargvalProvalLysval 291 :::               :::
	AQ .	292 SerValThrGluValLysargHisLysLeuGluThrGlylleArgLeuAspSerGluTyr 311 :: ::
US-09-857-669-2 (1-609) x US-09-815-242-6700 (1-2820)  Qy	νο 09	312 GlyLeuGlyGlyLysIlealaTyrAspTyrTyrAsnLeuPheAsnLysGlyTyrIleGly 331
:::   :::	276	
61 Asp	68 UDb	332 ServalvalTrpaspMerAspLysTyrGulnfrffreuklaalaGlylleSerGhPro 351 1186CAAATGCGGTTATACATGACAGAATTGACTTGTCGAAGCTGTCAA 1230

2245 ATTGAAATGCAC 2256

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US-09-070-927A-341/C

RESULT 33

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-----TTATCAGGCGTTCTTACATTTTAGATGAACCATCAATTGGTTTGCATCAACGA 1566
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     1747 AATCCGCATTCATTGACTGGACAA----TATCTTTCTGGGAAAAAAGTGATTCCTGTA 1800
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2041 GAAAAGATTGTTGACATTGATCAAAGTCCAATTGGTCGAACGCCAAGAAGTAATCCAGCG 2100
                             1288 GAAGTCAGTGAATTAGCAATAAAAATGCGGTCCAATTTTTTGAAGGTGTGTCTTTATCT 1347
                                                                                                                                                                                                                    1408 TTAAAAAATGTTGGGTTAGATTACTTAACCTTAAGTCGA-----GCTGCTGGTACACTT 1461
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  TTTAGTTTTAACGTCAAAGGTGGCCGTTGTGAAGCTTGTCGCGGGGATGGTATCATCAAA 2244
352 ArgAsnTyrArgGlyAsnTyrTrpThrSerAsnValSerTyrAsnArgSerThrThrGln 371
                                                                                                                                                                                   392 AspAlaArgLeuGlyAlaGluPheLeuAlaGluGlyArgLysIleProGlySerAspIle 411
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       546 ThrArgThrLeuSerGlyAlaValPheHisAspMetGlyAspAlaAlaAlaAsnPheLys 565
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      2101 ACTTATACT-----AGTGTTTTTGATGACATTCGCGATTTGTTTGCCCAAACAAT 2151
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       ArgMetLysLeuLysHisGlySerGlyLeuGlyValArgTrpPheSerProLeuAlaPro 585
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                                                                                                                             ....---GlyLeu 521
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                                                                                                                                                                                                                                                     AspLeuGlyAsnSerHis-----AlaThrMetLeuThrAlaSerTrpLysArg
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                                                                                                                                                                                                                                                                                                                                                                                 GluAsnGlyHisTyrLeuAspGly------LysIleGlyThrThrLeu---
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TITLE OF INVENTION: Enterococcus faecialis Polynucleotides and Polypeptides NUMBER OF SEQUENCES: 982 CORRESPONDENCE ADDRESS:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     11828 CAACGCTTAATGTCGACAGACAACAACATTTTTAACAAAACATGAATTTCACACMAAA 11769
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       34 PheAlaLeuPheLysAsnLysSerProAspThrGluSerValLysLeuLysProLysPhe 53
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                                                                                                                                                                                                                                                                                           ZIP: 20850
COMPUTER READABLE FORM:
MEDIUM TYPE: Diskette, 3.50 inch, 1.4Mb storage COMPUTER: HP Vectra 486/33
OPERATING SYSTEM: MSDOS version 6.2
SOFTWARE: ASCII Text
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  US-09-857-669-2 (1-609) x US-09-070-927A-341 (1-13884)
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Mismatches:
                                                                                                                                                                                         ADDRESSEE: Human Genome Sciences, Inc.
STREET: 9410 Key West Avenue
                                                                                                                                                                                                                                                                                                                                                                                                                                         APPLICATION NUMBER: US/09/070,927A
FILING DATE: 04-May-2000
CLASSIFICATION: <UNKNOWN>
PRIOR APPLICATION NUMBER: 60/046,655
FILING DATE: 1997-05-16
APPLICATION NUMBER: 60/044,031
FILING DATE: 1997-05-60
APPLICATION NUMBER: 60/066,009
FILING DATE: 1997-11-14
ATTORNEY/AGENT INFORMATION:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Matches:
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          NAME: Kenley K. Hoover
REGISTRATION NUMBER: 40,302
REFERENCE/DOCKET NUMBER: PB3
TELECOMMUNICATION INFORMATION:
TELEPHONE: (301) 309-8504
TELEFAX: (301) 309-6512
INFORMATION FOR SEQ ID NO: 341:
Sequence 341, Application US/09070927A Patent No. US20020120116A1 GENERAL INFORMATION:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          SEQUENCE CHARACTERISTICS:
LENGTH: 13884 base pairs
TYPE: nucleic acid
STRANDEDNESS: double
                                                          APPLICANT: Charles A. Kunsch
Patrick J. Dillon
Steven Barash
                                                                                                                                                                                                                                                                                                                                                                                                                          CURRENT APPLICATION DATA:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                TOPOLOGY: linear
                                                                                                                                                                                                                                CITY: Rockville
STATE: Maryland
                                                                                                                                                                                                                                                                            COUNTRY: USA
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Best Local Similarity:
Query Match:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     US-09-070-927A-341
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ADDRESSEE: Human Genome
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36.29%
21.52%
3.17%
                                                                                                                                                                                                                      CITY: Rockville
STATE: Maryland
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Best Local Similarity:
Query Match:
                                                                                                                                                                                                                                                          COUNTRY:
              US-09-070-927A-17
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RESULT 34
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|11390 AGTTTTATGAAAACTCTCTATGAAGAT---AATATTCTAATTGATTT------- 11346
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            ----GTTCAGCAAGGAACGCTTTTT-----AAC 11019
                                                                                                                                                                                                                                                                                                                       11442
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        11279 GGTTATCTATACAAAGAATTTGGGATTTCAGCAGACTACTTGCAGTATCATTACCAATTA 11220
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           AAT-----CATCAAACAAATAAATACGAAAACAAC---GGAACACTTAATATTT 11121
                                                                                                                                                                                      ---TTTGATACG 11595
                                                                                                                                                                                                                                                       11594 CAGGGACGTTTTGATAATTTTTACAAGCAGACGAAAGACACCTTTTACGACGGCGTCCAA 11535
                                                -----GCTGAACGCAAAGAT 11664
                                                                                                                11663 GTCGCCACAGGACATGAATTGCTAAGTGAGTCTTCGGGTCTATATTTGCGTAATTTAGCT 11604
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   GlyAspPheGluIleThrGlyThrGlnArgTyrProGluGlnIleValSerGlyLeuAla 244
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     245 ArgPheGlnProGlyThrProTyrAspLeuAspLeuLeuLeuAspPheGlnGlnAlaLeu 264
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       GluGlnAsnGlyHisTyrSerGlyAlaSerValGlnAlaAspPheAspArgLeuGlnGly 284
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           285 AspArgValProValLysValSerValThrGluValLysArgHisLysLeuGluThrGly 304
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  PheAsnLysGlyTyrIleGlySerValValTrpAspMetAspLysTyrGluThrThrLeu 344
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      365 TyrAsnArgSerThrThrGlnAsnLeuGluLys----ArgAlaPheSerGlyGlyIle 382
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             GlyArgLys1leProGlySerAspIleAspLeuGlyAsnSerHisAlaThrMetLeuThr 422
                                                                                                                                                                                                                      148 AspGlyAsnLeuAlaGluTyrTyrArgAsnAlaLeuGluAsnTrpGlnGlnProValGly 167
                                                                                                                                                                                                                                                                                                                                                             ArgLysGlyTyrProLeuAlaLysLeuGlyAsnThrArgAlaAlaValAsnProAspThr 207
            88 ThrGlyPheLeuAlaGluGluAlaProAspAsnValLySThrMetLeuArgSerLysGly 107
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             11219 ATAGATGCTATATTCTGAT-----GATTACCTCTTATCAAACGAAGTTT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              11441 GGTCATTTTAAA-----ACAGATCAGTATGATCAAGAATTAAAAAATTAGGCAAG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  AlaalaGlyIleSerGlnProArgAsnTyrArgGlyAsnTyrTrpThrSerAsnValSer
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                                                                              108 TyrPheSerSerLysValSerLeuThrGluLysAspGlyAlaTyrThrValHisIleThr
                                                                                                                                                    ProGlyProArgThrLysIleAlaAsnValGlyValAlaIleLeuGlyAspIleLeuSer
                                                                                                                                                                                                                                                                                         SerAspPheAspGlnAspSerTrpGluAsnSerLysThrSerValLeuGlyAlaValThr
                                                                                                                                                                                                                                                                                                                                                                                                                               208 AlaThrValAspLeuAsnValVal ......ValAspSerGlyArgProlleAlaPhe
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               IleArgLeuAspSerGluTyrGlyLeuGlyGlyLysIleAlaTyrAspTyrTyrAsnLeu
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        11120 GAATCTTTATTAACGATTGTCCATTTAAGTGAAGTGGGTATGGCGAAGCAGGAGTATT
                                                                                                                                                                                                                                                                                                                                                                                                                                                               ------GATTTACGGATCATTCGTTCATTAATTGAAGCAGG-------
                                                                                                                                                                                                                                                                                                                                                                                             -----AATGTCAATGCCTCGATTGAT----
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         ------TACGATAGTAAATCAAAACAA--
                                              11708 GGCGCCTTTTTAACCAATTATTACCAGAT---
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APPLICANT: Charles A. Kunsch
Patrick J. Dillon
Steven Barsah
TITLE OF INVENTION: Enterococcus faecialis Polynucleotides and Polypeptides
NUMBER OF SEQUENCES: 982
CORRESPONDENCE ADDRESS: 536 CCAAAAGAGTTGCTAATGCATTGGAATTGGGAACTTACTACGTGACCGAAACCAAAGCA 595 ------ 6CAGTAAAAGTC 634 -GCCAAT 652 49 69 ---- GlnGlnGluGluValLeuAspLys 85 Ala...GlyPheAla-..LeuPheLysAsnLysSerProAspThrGluSerValLysLeu ...-SerGluAsnLysAla LysProLysPheProValArgIleAspThrGlnAspSerGluIleLysAspMetValGlu COMPUTER READABLE FORM:
MEDIUM TYPE: Diskette, 3.50 inch, 1.4mb storage COMPUTER: HP Vectra 486/33
OPERATING SYSTEM: MSDOS Version 6.2
SOFTWARE: ASCII Text Length: Matches: Conservative: Mismatches: Indels: US-09-857-669-2 (1-609) x US-09-070-927A-17 (1-32768) Sciences, Inc. CURRENT APPLICATION DATA:
RAPLICATION NUMBER: US/09/070,927A
FILING DATE: 04-May 2000
CLASSIFICATION: <unknown> PRIOR APPLICATION DATA:
APPLICATION DATA:
FILING DATE: 1997-05-16
APPLICATION NUMBER: 60/044,031
FILING DATE: 1997-05-06
APPLICATION NUMBER: 60/066,009
FILING DATE: 1997-11-14
ATTORNEY/AGENT INFORMATION: ; TOPOLOGY: linear ; SEQUENCE DESCRIPTION: SEQ ID NO: 17: US-09-070-927A-17 NAME: Kenley K. Hoover
REGISTATION UNBER: 40,302
REFERENCE/DOCKET NUMBER:
TELECOMMUNICATION INFORMATION:
TELEFAX: (301) 309-8504
TELEFAX: (301) 309-8512
INFORMATION FOR SEQ ID NO: 17: GluHisLeuProLeuIleThrGln-----STREET: 9410 Key West Avenue TCTAATGGCTTCGTGAATACCTTTAAA----ProHisAlaTyrAlaProAlaAlaAspLeu-Sequence 17, Application US/09070927A Patent No. US20020120116A1 GENERAL INFORMATION: LENGTH: 32768 base pairs TYPE: nucleic acid STRANDEDNESS: double

	O 40		Oy 4	RESULT	; Seque			APPI	APPI			PRIC			PRIC PRIC PRIC PRIC PRIC PRIC PRIC PRIC		ഗ	; TYP ; ORG US-09-8	Alignme	Pred. N Score: Percent	Best Lo Query M	: 10B:	450-80 AD	9C QQ		.,	T &A	
653 CAAACCGTGGCCCTTGTGACCAGCAATATCAAAGGGCAAAAACCAAGAAATTACTGGG 709	86 GluGlnThrGlyPheLeuAlaGluGluAlaProAspAsnValLysThrMetLeuArgSer 105	710CAAACAACTCTGATAAAAGAAGACAAGGATACTGGAGATAAAACACAAGGCAGGGCA 766	106 LysGlyTyrPheSerSerLysValSerLeuThrGluLysAspGly 120 ::: 767 GTCTTTGAGGGGACTGAATAYACCTTGTTTATATGCTTAAGGAAGGGAAAAAGGGACTGAATAAAAGGAAGG				887 CTGGCTTTAGATGAAAGAATCAAGCTGCCGTTAAACATTAGCC 931	153GluTyrTyrArgAsnAlaLeuGluAsnTrpGlnGlnProValGly 167 		180 ThrSerValLeu	:::   ::: 1034 AATGCCGTRAFTACCGAGATGTTACGGCAAAAGAACAGATTATTCGTTTTGGGTTTGAT 1093		1094 TTCTTCAAATTTGCYGGATCRGCYGMTGGCACTGCCGAAACTGGGTTT 1141	213 AsnValValAspSerGlyArgProIleAlaPheGlyAspPheGlulleThrGlyThr 232     :::	233 GlnArgTyrProGluGLnIleValSerGlyLeuAlaArgPhe 246 :::		:::	AsnGlyHisTyrSerGlyAlaSerValGlnAlaAspPheAspArgLeuGlnGlyAspArg	TTTCAAAAAATTACGCCATTAGAAATCCGTTCTACTTTTAAGGAAAACAAAGAAGACTTT	20/ VALFFOVALLYSVALSEYVALTNICLUVALLYSARGHISLYSLEGUSLURTH 303	304 GlylleArgLeuAspSerGluTyrGlyLeuGlyGlyLyslleAlaTyrAspTyrTyrAsn 323	1433GTGACCGTTCCTTACGAAAAG 1453	324 LeuPheAsnLysGlyTyrIleGlySerValValTrpAspMetAspLys 339            :::	TyrGluThrThrLeuAlaAlaGlyIleSerGlnProAraAsnTyrArgGlv		357 AsnTyrTrpThrSerAsnValSerTyrAsnArgSerThrThrGlnAsnLeuGluLysArg 376		377 AlaPheSerGlyGlyIleTrpTyYValArgAspArgAlaGlyIleAspAlaArgLeu 395 1634
qq	ò	đ	O D	οy	q	Οy	셤	ογ Dp	Qy Db	ογ	QQ	0y	đ	ç d	QQ QD	ογ	qq	oy 4	<b>Q</b> :	Q Q	ογ	q	oy Op	ò	qo	ογ	QQ	oy D

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676 GCTGCCCAAGAAAAAGACGAAAAAGCCAAACCAGTGGTAATTGCCGAAACAACGACCACT 1735
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           99 ValLysThrMetLeuArgSerLysGlyTyrPheSerSerLysValSerLeuThrGlu--- 117
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            118 LysaspGlyAlaTyrThrVal-------HisileThrProGlyProArgThr 132
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          133 LysilealaAsnValGlyValAlaIleLeuGlyAspIleLeuSerAspGlyAsnLeuAla 152
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             80 GluGluValLeuAspLysGluGlnThrGlyPheLeuAlaGluGluAlaProAspAsn---
                                                                                                                                                                                                                                                                                                                                     APPLICANT: Haselber, Kari L.
APPLICANT: Cark, Kooff L.
APPLICANT: 2yskind, Judith W.
APPLICANT: Wall, Daniel
APPLICANT: Wall, Daniel
APPLICANT: Travick, John D.
APPLICANT: Travick, John D.
APPLICANT: Travick, John D.
APPLICANT: Vamamoto, Robert T.
APPLICANT: Vamamoto, Robert T.
APPLICANT: Vamamoto, Robert T.
APPLICANT: Xu, H. Howard
TITLE OF INVENTION: Identification of Essential Genes in
TITLE OF INVENTION: Identification of Essential Genes in
TITLE OF INVENTION: 1000-10-3-21
CURRENT FILING DATE: 2000-03-21
PRIOR APPLICATION NUMBER: 60/206,848
PRIOR FILING DATE: 2000-05-23
PRIOR APPLICATION NUMBER: 60/206,848
PRIOR APPLICATION NUMBER: 60/206,33
PRIOR APPLICATION NUMBER: 60/206,33
PRIOR APPLICATION NUMBER: 60/245,578
PRIOR APPLICATION NUMBER: 60/253,625
PRIOR APPLICATION NUMBER: 60/253,93
PRIOR APPLICATION NUMBER: 60/253,93
PRIOR APPLICATION NUMBER: 60/259,308
PRIOR APPLICATION NUMBER: 60/269,308
PRIOR APPLICATION NUMBER: 60/250,628
NUMBER OF SEQ ID NOS: 14110
SEQ ID NO 4584
LENGTH: 6258
LENGTH: 6258
LENGTH: 6258
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103
81
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Conservative:
Mismatches:
Indels:
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                                                                                                                                                                                                                                              Jence 4584, Application US/09815242
sent No. US20020061569A1
STAL INFORMATION:
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                                                                                                                                                                                                                                                                                                                   PPLICANT: Haselbeck, Robert
PPLICANT: Oblisen, Karl L.
PPLICANT: 2yskind, Judith W.
PPLICANT: Wall, Daniel
PPLICANT: Trawick, John D.
PPLICANT: Carr, Grant
PPLICANT: Yanamoto, Robert T.
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19.62%
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-815-242-4584
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à	90	GluGluValLeuAspLysGluGlnThrGlyPheLeuAlaGluGluAlaProAspAsn 98 	
oy a	99	VallysThrMetLeuargSerLysGlyTyrPheSerSerLysValSerLeuThrGlu 117 :::	
ζ	118	LysAspGlyAlaTyrThrVal	
ογ	133	LysilealaasnValGlyValAlaileLeuGlyAspileLeuSerAspGlyAsnLeuAla 152	
q	9910	AAATTG 9915	
ò	153	erAspPheAspGln	
3 8	173		
유	9955		
ò	193	LeualaLysLeuGlyAsnThrArgAlaAlaValAsnProAspThrAlaThr 209	
qq	9994	:::	
δ	210	ValAspLeuAsnValValValAspSer 218	
g	10045	CAAAACTATCTTGATGCTACAGAAAGTAACAAAACAAACTATAACAATGCTGTTGATAGT 10104	
δ	219	GlyArgProlleAlaPheGlyAspPheGluIleThrGlyThrGlnArgTyrProGluGln 238	
g	10105	GCTAATGGTCATTAATGCAACAAGCAATCCAAATATGGATGCTAAT 10152	
δ	239	IleValSerGlyLeuAlaArgPheGlnProGlyThrProTyrAspLeuAspLeuLeuLeu 258	
qq	10153	.aaatggtacacaagtgacatcaaggaaaaatgca	
ò	259	AspPheGlnGlnAlaLeuGluGlnAsnGlyHisTyrSerGlyAlaSerValGlnAla 277 :::         ::: AATTTAACGCAAGGGAACAACAGGAAGAAAGGCCAACGAAGGAAGGGAAGGGAAGAGAAGA	
ŏ	278	297	
Op	10264	AACTTAAATAAAGCACAAAAAGATGCGTTAAAAGCACAAGTTACAAGTGCGCAA 10317	
οy	298	ArgHisLysLeuGluThrGlyIleArgLeuAspSerGluTyrGlyLeuGlyGlyLysIle 317	
Q	10318	CGTGTTGCAAATGTAACAAGTATCCAACAACTGCA	
ογ	318	AlaTyrAspTyrTyrAsnLeuPheAsnLysGlyTyrIleGlySerValValTrpAspMet 337	
С	10354	AAFGAACTFAATACAGCTATGGGTCAATTACAACATGGTATT 10395	
ò	338	laAlaGlyIl	
Q D	10396	GATGATGAAAACGCAACAAAACAAACTCAAAATATCGTGACGCT 10440	
ò	358	TyrTrpThrSerAsnValSerTyr	
QQ	10441	GAACAAAGTAAGAAAACTGCTTATGATCAAGCTGTAGCTGCTGCGAAAGCAATTTTAAAT 10500	
8 %	367	ArgSerThrThrGlnAsnLeuGluLysArgAlaPheSerGlyGlyIleTrpTyrval 385 :::	
ογ	386	ArgAspArgAlaGlyIleAspAlaArgLeuGlyAlaGluPheLeuAlaGluGly 403	
Op	10561		

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11014 ---TTACCAAACTTAACACAATTACAAAAAGATAAACTTGAAGCATCAAGTTGAAGTTGAAGGG 11070
                              10618 AAACAAAACTTAGGTACTTTAAACCATATTACAAATGCACAACGTACTGCGTTAGAAGGT 10677
                                                                                                                                                                                                                                                            :::|||
10792 TTAAGAAATCAA-----AATTATCTTGATGCAGATGAATCAAAAGGTAACGCATAT 10842
                                                                                                                                                                                                                                                                                                                                     10903 AAAGCAGACGTTGATAATGCATTAAATACAGTTACAAGAGCGAAAGCGGCTTTAAATGGT 10962
                                                                                                     440 HisTyrLeuAspGlyLysIleGlyThrThrLeuGlyThrPheLeuSerSerThrAlaLeu 459
                                                                                                                                                                                                                                  460 IleargThrSeralaArgAlaGlyTyrPhePheThrProGluAsnLysLys----- 476
                                                                                                                                                                                                                                                                                                         424 SerTrpLysArgGlnLeu------LeuAsnAsnValLeuHisProGluAsnGly 439
                                                                                                                                                                                                                                                                                                                                                                                          492 ArgAspAsnAlaAspValProSerGlyLeuMetPheArgSer------GlyGly 507
                                                                                                                                                                                                                                                                                                                                                                                                                                                                    AlaSerSerValArgGlyTyrGluLeuAspSerIleGlyLeuAlaGlyProAsnGlySer 527
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               528 ValLeuProGlu---ArgAlaLeuLeuValGlySerLeuGluTyrGlnLeuProPheThr 546
404 ArglysIleProGlySerAspIleAspLeuGlyAsnSerHisAlaThrMetLeuThrAla 423
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  t, or 9.
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: LOCATION: (25184)..(25184)

: OTHER INFORMATION: The n at this position can be a, c,

US-09-782-378A-26
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Matches:
Conservative:
Mismatches:
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Patent No. US20020102731A1
GENERAL INFORMATION:
GENERAL INFORMATION:
APPLICANT: Bahou, Wadle
APPLICANT: Bahou, Wadle
APPLICANT: Bahou, Wadle
APPLICANT: Sandalon, Ziv
APPLICANT: Gnatenko, Dmitri
TITLE OF INVENTION: Adenoviral Vectors
FILE REFERENCE: STONKE 04970
CURRENT APPLICATION NUMBER: US/09/782,378A
CURRENT FILING DATE: 2001-02-12
PRIOR FILING DATE: 2000-10-02
NUMBER OF SEQ ID NOS: 27
NUMBER OF SEQ ID NOS: 27
SOFTWARE: PatentIn Version 3.0
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ORGANISM: Human adenovirus type 17
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Best Local Similarity:
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LENGTH: 35100
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SerTrp 175 	ThrGln 233     Acccac 11972 TyrAsp 253  ::  GACGG 12032 Glyala 273 AGCACA 12086	Serval 293 :::    GCGTG 12137 GlyLeu 313        GGCTG 12170 Serval 333 :::    AACGTG 12221	ACCGAG 12281 TYTASN 366 AGACAG 12341 TTPTYT 384 1    TGGGGC 12398	
ArgAsnalaLeuGluAsnTrpGlnGlnProValGlySerAspPheAspGlnAspSerTrp	ValValValAspSerGlyArgProIlealaPheGlyAspPheGluIleThrGlyThrGln                 GCGGTGGTCCCTTCT	SerValGlaAlaAspPheAspArgLeuGlnGlyAspArgValProValLysValSerVal :::	CCGCCCGGCCGGCAGGATGATTATCAGCGCCTGCGCCTGATGCTGACCGAG  IleSerGlnProArgAsnTyrArgGlyAsnTyrTrpThrSerAsnValSerTyrAsn :::	ULT 38 09-974-300-7800 iequence 7800, Application US/09974300 iequence 7800, Application US/09974300 attent No. US20020146721A1 APPLICANT: BERYA, Randy M. TITLE OF INVENTION: Methods For Monitoring Multiple Gene TITLE OF INVENTION: Bearssion FILE REFERENCE: 10085.500-03 FILE REPERENCE: 10085.500-03 FRICH APPLICATION NUMBER: US/09/974,300 CURRENT FILING DATE: 2001-10-05 PRIOR APPLICATION NUMBER: 06/279,526 PRIOR FILING DATE: 2000-10-06 PRIOR FILING DATE: 2000-10-06 PRIOR FILING DATE: 2000-10-06 PRIOR FILING DATE: 2001-03-27 NUMBER OF SEQ ID NOS: 8481 SOFTWARE: FASLSEQ for Windows Version 4.0 EW ID NO 7800 TEMCTH: 2085 TYPE: DNA
ArgAsnAlaLeuGluAsnT 	ValvalvalaspserG	ServalGlnAlaAspPI :::        AACGTCCAGTCCAACC: ThrGluValLySArgH: :::    CGCAGCGCGCGCGTG GIGGLAGGCGGTG GIGGLAGGCGGTG GGCAGCGCGCTG GGCTGCCGTGGCGGGTG GGCTCCTGGCGCGGGGGGGG		SULT 38 -09-974-300-7800 Sequence 7800, Application US/09974300 Patent No. US20020146721A1 GENERAL INFORMATION: APPLICANT: Berra, Randy M. APPLICANT: Clausen, Ib Groth TITLE OF INVENTION: Expression TITLE OF INVENTION: Expression TITLE OF INVENTION: Expression FILE REFERENCE: 10085.500-US CURRENT APPLICATION NUMBER: US/09/974 CURRENT FILING DATE: 2001-10-05 PRIOR APPLICATION NUMBER: 60/279,526 PRIOR FILING DATE: 2001-00 PRIOR APPLICATION NUMBER: 60/279,526 PRIOR FILING DATE: 2001-03-27 NUMBER OF SEQ ID NOS: 8481 SOFTWARE: FASLESC for Windows Version SEQ ID NO 7800 TYPE: DNA
156 11796 176 11844 1904	214 11940 234 11973 254 12033	274 12087 294 12138 314 12171	12222 348 12282 367 12342 385	US-09-974-30 US-09-974-30 US-09-974-30 PACHICANT APPLICANT TITLE OF TITLE OF TITLE REFE CURRENT APPLICANT PRIOR APP PRIOR PIL PRIOR FIL
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663 -----GCTCATTACACGCAGCTGCTT-----
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127
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                                                   Length:
Matches:
Conservative:
Mismatches:
Indels:
Gaps:
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33.80%
22.01%
3.14%
; ORGANISM: Bacillus clausii
US-09-974-300-7800
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Best Local Similarity:
Query Match:
                                        Alignment Scores:
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357 AsnTyrTrpThrSerAsnValSerTyrAsnArgSerThrThrGlnAsnLeuGluLysArg 376
                                                                                                           ORGANISM: Arabidopsis thallana US-09-938-842A-1039
PRIOR FILING DATE: 2001-01-16
PRIOR APPLICATION NUMBER: US 6
PRIOR FILING DATE: 2001-06-22
NUMBER OF SEQ ID NOS: 5379
SEQ ID NO 1039
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Best Local Similarity:
Query Match:
DB:
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APPLICANT: Kreps, Joel
APPLICANT: Kreps, Joel
APPLICANT: Kreps, Joel
APPLICANT: Wang, Yun
APPLICANT: Zhu, Tong
TITLE OF INVENTION: STRESS-REGULATED GENES OF PLANTS, TRANSGENIC PLANTS CONTAINING
TITLE OF INVENTION: SARE, AND METHODS OF USE
TITLE OF ILINGENIES SCRIPL300-3
CURRENT APPLICATION NUMBER: US/09/938,842A
CURRENT FILING DATE: 2001-08-24
PRIOR PPLICATION NUMBER: US 60/227,866
PRIOR FILING DATE: 2000-08-24
PRIOR FILING DATE: US 60/264,647
                                                                                                                                                                                                            1185 TGGGGGGATTATGCGATGAACCGGATT-----GAGCCAGGCAATGTGGTGGTCGATGG 1235
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1449 ACCACACAAGGGGCACATTCATTGAGTGTTGCCGATGTGGGGATGGCAACATGAG 1508
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   --GlyileTrpTyr 384
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                             GCGAACAACCAATTG-----CGGGATTTTGAAGGTTTTATCGTTGAAGGCCCTGAGTAT
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369 ThrThrGlnAsnLeuGluLysArgAlaPheSerGly
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121 TTTCACTCTACAATACTCAAATCAAAGGCAGAGTCTGCT-------GCACCT 165
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1321 ACAACCGATCCCAGGGAAGGAAGGTCTTCACAGTATTGCACTGATGTTGCAAAGGCTTTG 1380
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| 1273 TGTACCGGTGGAACAGTG-------CACATTGTGGTGAATAATCAAGTGGCTTTC 1320
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913 GTTTTGGGTAATGTTGTTAGAAAACCTCTACGCCAAATATTCAGCGAGTTTAGCGGTGGT 972
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AlaGluPheLeuAlaGluGlyArgLys--------IleProGly 408
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                                           377 AlaPheSerGlyGlyIleTrpTyrValArgAspArgAlaGlyIleAspAlaArgLeuGly 396
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                                                                         760 AATTTCTTGGCTACTAAGTGGACCACGGCTAAAAGGTTTGGACTGGAA-----GGT
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APPLICANT: MIWA, TERSUYA
APPLICANT: KIDA, TAKAO
APPLICANT: IGARASHI, DAISUKE
APPLICANT: OHSUMI, CHIEKO
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TITLE OF INVENTION: METHOD FOR PRODUCING TRANSFORMED PLANT HAVING INCREASED GLUTA TITLE OF INVENTION: CONTENT CONTENT CONTENT CONTENT CONTENT CONTENT CONTENT CONTENT APPLICATION WINBER: US/09/897,056 CURRENT FILING DATE: 2001-07-03 PRIOR PILILATION NUMBER: UP 2000-215279 PRIOR FILING DATE: 2000-07-17 NUMBER OF SEQ ID NOS: 11 SOFTWARE: PATENTIAN OFFICE CONTENT CONT
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Search completed: November 9, 2002, 03:59:22 Job time: 497 secs

GenCore version 5.1.3 Copyright (c) 1993 - 2002 Compugen Ltd.

 protein search, using sw model OM protein

November 9, 2002, 01:14:59; Search time 32 Seconds (without alignments) 3921.334 Million cell updates/sec Run on:

US-09-857-669-2 3173 1 MMIKPTALLLPALFFFPHAY......IAYGHSDKKIRWHISLGTRF 609 Title: Perfect score: Sequence:

Scoring table:

BLOSUM62 Gapop 10.0 , Gapext 0.5

671580 seqs, 206047115 residues Searched:

671580 Total number of hits satisfying chosen parameters:

Minimum DB seq length: 0 Maximum DB seq length: 200000000

Post-processing: Minimum Match 0%
Maximum Match 100%
Listing first 45 summaries

Database :

SPTREMBL_21:*

sp_plant:*
sp_rodent:*
sp_virus:*
sp_vertebrate:*
sp_unclassified:* 1: sp_archea:*
2: sp_bacteria:*
3: sp_fungi:*
4: sp_human:*
5: sp_invertebrate:*
6: sp_manmal:*
7: sp_mhc:*
8: sp_organelle:*
9: sp_phage:* sp_rvirus:*
sp_bacteriap:*
sp_archeap:* Pred. No. is the number of results predicted by chance to have a score greater than or equal to the score of the result being printed, and is derived by analysis of the total score distribution.

## SUMMARIES

		ø				
Result		Query				
NO.	Score	Match	Match Length DB	DB	QI	Description
1	3153	99.4	615	16	О9ЛИМ5	Q91wm5 neisseria m
7	3136	98.8	635	16	Q9JXB7	
m	296	18.8	589	16	Q8XWT6	
4	449	14.2	579	16	Q910U1	Q910ul pseudomonas
S	368.5	11.6	578	16	Q8ZB95	08zb95 versinia pe
9	355.5	11.2	577	16	Q8XEL5	O8xel5 salmonella
7	348	11.0	582	16	Q9KP31	09kp31 vibrio chol
80	340	10.7	618	16	602LN9	Q92in9 rhizobíum m
σ'n	336	10.6	586	16	Q9CK26	Q9ck26 pasteurella
10	332.5	10.5	765	16	08XZI3	08xzi3 ralstonia s
11	323.5	10.2	641	16	Q8UC83	O8uc83 agrobacteri
12	306.5	9.7	617	16	Q9PD27	
13	300	9.5	738	7	Q9X3V8	Q9x3v8 zymomonas m
14	292	9.5	593	7	Q9EY32	Q9ey32 xanthomonas
15	290.5	9.5	623	16	Q8YEI3	Q8yei3 brucella me
16	279	8.8	833	16	Q8YUR6	Olyuré anabaena sp

0997w6 caulobacter P95359 neisseria g Q9k10 neisseria m O91x31 neisseria m O30912 neisseria m O67326 aquifex aeo C82h58 yersinia per C92h29 versinia con C92h29 versin	Q92q48 rhizobium m Q8ufl6 agrobacteri Q8z016 anabaena sp Q51930 pasteurella Q98mc3 rhizobium l Q8rht4 fusobacteri
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## ALIGNMENTS

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TEXAIN-GMILOND:
MEDLINE-21081070;
MEDLINE-21081079;
MEDLINE-21081079;
MEDLINE-21081079;
Mangenot M., Genin S., Artiguenave F., Gouzy J., Mangenot S.,
Arlat M., Billault A., Brottier P., Camus J.C., Cartolico L.,
Chandler M., Choisne N., Claudel-Remard C., Cunnac S., Demange N.,
Gaspin C., Lavie M., Moisan A., Robert C., Saurin W., Schiex T.,
Siguler P., Thebault P., Whalen M., Wincker P., Levy M.,
Meissenbach J., Boucher C.A.;
"Genome sequence of the plant pathogen Ralstonia solanacearum.";
Mature 415.497-502(2002).
                              MMIKPTALLLPALFFFPHAYAPAADLSENKAAGFALFKNKSPDTESVKLKPKFPVRIDTO
                                           DSETKDMVEEHLPLITQQQEEVLDKEQTGFLAEEAPDNVKTMLRSKGYFSSKVSLTEKDG
                                                                                                     YQLPFTRTLSGAVFHDMGDAAANFKRMKLKHGSGLGVRWFSPLAPFSFDIAYGHSDKKIR
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          IIRGQAGYTVARDNADVPSGLMFRSGGASSVRGYELDSIGLAGPNGSVLPERALLVGSLE
                                                                                                                                                AYTVHITPGPRTKIANVGVAILGDILSDGNLAEYYRNALENWQQPVGSDFDQDSWENSKT
                                                                                                                                                                                                                                                                                    Raistonia solanacearum (Pseudomonas solanacearum).
Bacteria; Proteobacteria; beta subdivision; Raistonia group;
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Last annotation update)
 Mismatches
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   Conservative
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01-MAR-2002 (TrEMBLrel.
01-MAR-2002 (TrEMBLrel.
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NCBI_TaxID=305;
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SEROGROUP B;

STAIN-MCSB / SEROGROUP B;

STRAIN-MCSB / SEROGROUP B;

STRAIN-MCSB / SEROGROUP B;

STRAIN-MCSB / SEROGROUP B;

STRAIN-MCSB / SEROGROUP B;

A Tettelin H., Saunders N.J., Heldelberg J., Jeffries A.C., Nelson K.E.,

Relson W.C., Gwinn M.L., DeBoy R., Peterson J.E., Hickey E.K.,

Haft D.H., Salzberg S.L., White O., Fleischmann R.D., Dougherty B.A.,

A Mason T., Clecko A., Parkeey D.S., Blair E., Cittone H., Clark E.B.,

Cotton M.D., Utterback T.R., Khouri H., Oin H., Vamathevan J.,

A Smith H.O., Fraser C.M., Moxon E.R., Rappuoli R., Venter J.C.;

"Complete genome sequence of Neisseria meningitidis serogroup B strain

Extended 287:1809-1815(2000).
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 DSEIKDMVEEHLPLITQQQEEVLDKEQTGFLAEEAPDNVKTMLRSKGYFSSKVSLTEKDG 126
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Bacteria; Proteobacteria; beta subdivision; Neisseriaceae; Neisseria
                           SNVSYNRSTTQNLEKRAFSGGIWYVRDRAGIDARLGAEFLAEGRKIPGSDIDLGNSHATM
                                                                                                                                                                                                                                                                                                                                                                                                      SGLARFQPGTPYDLDLLLDFQQALEQNGHYSGASVQADFDRLQGDRVPVKVSVTEVKRHK
                                                                                                                                                                                                           LETGIRLDSEYGLGGKIAYDYYNLFNKGYIGSVVWDMDKYETTLAAGISQPRNYRGNYWT
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                                                                                       SVLGAVTRKGYPLAKLGNTRAAVNPDTATVDLNVVVDSGRPIAFGDFEITGTQRYPEQIV
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635 AA; 69801 MW; 2B371F4A7A9DDA98 CRC64;
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(TremBLrel. 15, Last sequence update)
(TremBLrel. 20, Last annotation update)
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No. 3.4e-191;
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STRAIN-ATCC 15692 / PAO1;
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Bacteria; Proteobacteria; gamma subdivision; Pseudomonadaceae;
Pseudomonas.
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                                                                                                                                            Matches 160; Conservative 105; Mismatches 271;
                                                                                  18.8%; Score 596; DB 16; 27.9%; Pred. No. 1.2e-29;
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BEDLINE-21470411; PubMed-11586350.
Parkhill J., Wren B.W., Thomson N.R., Titball R.W., Holden M.T.G.,
Prentice M.B., Sebaihia M., James K.D., Churcher C., Mungall K.L.,
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                                                                                                                                                                     84;
                                                                                                                Length 579;
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EMBL; AE004682; AAĞ05931.1; -.
Hypothetical protein; Complete proteome.
SEQUENCE 579 AA; 63739 MW; 23467005C836FBBF CRC64;
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Last annotation update)
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14.2%; Score 449; DB 16;
Best Local Similarity 22.9%; Pred. No. 2.5e-20;
Matches 144; Conservative 111; Mismatches 289;
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01-MAR-2002 (TrEMBLrel. 20,
01-JUN-2002 (TrEMBLrel. 21,
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Baker S., Basham D., Bentley S.D., Brooks K., Cerdeno-Tarraga A.M., Chillingworth T., Cronin A., Davies R.M., Davis P., Dougan G., Feltwell T., Hamiln N., Holroyd S., Jagels K., Karlyshev A.V., Leather S., Moule S., Oyston P.C.F., Quail M., Rutherford K., Simmonds M., Skelton J., Stevens K., Whitehead S., Barrell B.G.; "Genome sequence of Yersinia pestis, the causative agent of plague.";
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            400
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          284 TASWRKP-----WMNSFGHSLTTTTALSAPEQTLDFSYRIPLLRN-----PLEQYYL 330
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          226 DFEITGTQRYPEQIVSGLARFQPGTPYDLDLLLDFQQALEQNGHYSGASVQADF-DRLQG 284
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                                                                                                                                                                                                                                                                                                                                Length 578;
                                                                                                                                                                                                                                                                                                                                                       ; Pred. No. 3.4e-15;
93; Mismatches 264; Indels
                                                                                                                                                                         EMBL; AJ414157; CAC92753.1; -.
InterPro; IPR000566; Lipocln_cytraBP.
PROSITE; PS00213; LIPOCALIN; UNKNOWN.1
HYPOCHELICAl protein; Complete protecome.
SEQUENCE 578 AA; 64405 MW; 69AD3780BFDC20F1 CRC64;
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                                                                                                                                                       Nature 413:523-527(2001)
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565 THGVQFYIGLG 575
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ZEQUENCE FROM W.A.

SEQUENCE FROM W.A.

MEDLINE-21534947; PubMed-11677608;

MEDLINE-21534947; PubMed-11677608;

A Barkhill J., Dougan G., James K.D., Thomson N.R., Pickard D., Wain J.,

A Churcher C., Mungall K.L., Bentley S.D., Holden M.T.G., Sebaihia M.,

Baker S., Basham D., Brooks K., Chillingworth T., Connerton P.,

RA Baker S., Basham D., Haque A., Holroyd S., Jagels K.,

RA Feltwell T., Hamiln N., Haque A., Hen T.T., Holroyd S., Jagels K.,

RA Krogh A., Larsen T.S., Leather S., O'Gaora P., Parry C.,

RA Miltehead S., Barrell B.G.;

RY Gomplete genome sequence of a multiple drug resistant Salmonella

RI "Complete genome sequence of a multiple drug resistant Salmonella

RI "Complete Salzagoli; ...

RHBL; AE008906; AALZ32991; ...

RHBL; AL627283; CAD068891; ...

RHBL; AL627283; CAD068891; ...

RHBL; AL627283; CAD068891; ...

RHBL; ALCOMOSO66; Lipcoln_cytFABP.
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"Complete genome sequence of Salmonella enterica serovar Typhimurium
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                                                                                                                                                        Enterobacter1aceae;
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Putative outer membrane protein (Putative exported protein).
                                                                                                                                                                                                                                                                                                                                                     SPECIES-S.typhimurium; STRAIN-LT2 / SGSC1412 / ATCC 700720; MEDLINE-21534948; PubMed-11677609;
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SEQUENCE 577 AA; 64765 MW; FBA4A190173BF18C CRC64;
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les 267;
                                                                                                                                                        subdivision;
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PROSITE; PS00213; LIPOCALIN; UNKNOWN_1.
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:::
                                                                                                                                                Bacteria; Proteobacteria; gamma
                        YTEM OR STM4409 OR STY4758. Salmonella typhimurium, and Salmonella typhi.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Nature 413:852-856(2001).
                                                                                                                                                                                         Salmonella.
NCBL_TaxID=602, 601;
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Matches 134; Conserv
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STRAIN-EL TOR N16961 / SEROTYPE 01;

MEDLINE-2040633; pubMed-1095301;

Haidelberg J.F., Eisen J.H., Hickey E.K., Peterson J.D., Umayam L.A.,

Bodson R.J., Haft D.H., Hickey E.K., Peterson J.D., Umayam L.A.,

Gill S.R., Nelson K.E., Read T.D., Tettelin H., Richardson D.,

Ermolaeva M.D., Vamathevan J., Bass S., Qin H., Dragol I., Sellers P.,

McDonald L., Utterback T., Fleischmann R.D., Niermann W.C., White O.,

Salzberg S.L., Smith H.O., Colwell R.R., Mekalanos J.J., Venter J.C.,
                                                                                               453
                                                                                                                                           548
                                                                                                                                                                 117 -EKDGAYTVHITPGPRTKIANVGVAILGDILSDGNLAEYYRNALENWQQPVGSDFDQDSW 175
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       209 DENRVMSLRPFKQGEPYLVSQVGEFNQNLSNTDWFSSVFVEPDLSQLDEGRELPIKKVTLA 268
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337 TDLNDTEQDSTTLAVSRYWDLSSGWQRAI---NLRWSFDHFTQGNVTNTTMLFYPGVMIS 393
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NCBI_TaxID=666;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           46 KDNVEAYLSSIAAQDYSTSLRFQSQLERSMT-----EA-----LNALGYYHPSIDFTV
                                                                                        RTRSRGGLMPTWGDSQRYSVDYSNTAWGSDVDFSVLQAQNVWIRTLYDRHRFVMRANLGW
                                                                                                                                      489 TVARDNADVPSGLMFRSGGASSVRGYELDSIGLAGPNGSVLPERALLVGSLEYQLPFTRT
                                                                                                                                                                                                                                     LSGAVFHDMGDAAANFKRMKLKHGSGLGVRWFSPLAPFSFDIAYGHSDKK---IRWHISL
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Indels 102;
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582 AA; 65644 MW; E96946FB85F1C426 CRC64;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Last sequence update)
Last annotation update)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Query Match 11.0%; Score 348; DB 16;
Best Local Similarity 23.1%; Pred. No. 6.8e-14;
Matches 136; Conservative 96; Mismatches 255;
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PROSITE; PS00213; LIPOCALIN; UNKNOWN_1.
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InterPro; IPR000566; Lipocln_cytFABP.
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                                                --YFFTPENKKLGT-
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EMBL; AE004323; AAF95689.1; -.
TIGR; VC2548; -.
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SEQUENCE 5
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A MEDLINE-21396507; PubMed-11481430;
A Capela D., Barloy-Hubler F., Gouzy J., Bothe G., Ampe F., Batut J.,
A Boistard P., Becker A., Boutry M., Cadieu E., Dreano S., Gloux S.,
A Godrie T., Goffeau A., Kahn D., Kiss E., Lelaure V., Masuy D.,
A Pohl T., Portetelle D., Puehler A., Purnelle B., Ramsperger U.,
A Renard C., Thebault P., Vandenbol M., Weidner S., Galibert F.;
Thanlysis of the chromosome sequence of the legume symbiont
T sinorhizobium meliloti strain 1021."
B Proc. Natl. Acad. Sci. U.S.A. 98:9877-9882(2001).
B RHEL, AL591792, CAC47575.1;
B InterPro: IPR001064; Bac_surfAg_D15.
B InterPro: IPR001064; Bac_surfAg_D15.
B InterPro: IPR001064; Bac_surfAg_D15.
B Fam: PF01103; BR001064; Bac_SurfAg_D15.
B Fam: B 
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295 EVKRHKLETGIRLDSEYGLGGKIAYDYYNLFNKGYIGSVVWDMDKYETTLAAGISQP---
                                                                                                                                                                                                                                                                                                                          329 ALNEYYRIOYGMKHL--DKRDTESLESNLSLERHW---------
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 269 POARNOLETGLGYSTDVGVRGSLKWKKPWVNSQGHSFDSSFSLSIPEQTITAGYKIPLED
                                                                                                                                                                                                                                             ---RNYRGNYWTSNVSYNRSTTQNLEKRAFSGGIWYVRDRAGIDARLGAEFLAEGRKIPG
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              473 LRFFAGGDNNLRGYGYKSISPQDASGALTGAKYIATSSIEYQYRLTGNWWAAMFMDVGDA
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    409 SDIDLGNSHATMLTASWKRQLLNNV---LHPENGHY-LDGKIGTTLGT------
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Rhizoblum mellioti (Sinorhizoblum mellloti).
Bacteria: Proteobacteria: alpha subdivision; Rhizoblaceae group;
Rhizoblaceae; Sinorhizoblum.
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Hypothetical protein; Complete proteome.
SEQUENCE 618 AA; 65656 MW; E51276BB29B1FB78 CRC64;
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01-DEC-2001 (TrEMBLrel. 19, Last sequence update)
01-JUN-2002 (TrEMBLrel. 21, Last annotation update)
Hypothetical protein R02996.
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PROSITE; PS00225; CRYSTALLIN_BETAGAMMA; UNKNOWN_1.
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116 --TEKDGAYTVHITPGPRTKIANVGVAILGDILSDGNLAEYYRNALENWQQPVGSDFDQD 173
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  OKPPKKDQLIAHVKIGKPVKIADVDFVLQGEATQDPEFIAVTKNIPEK-----GSILNHE
                                                                                                     SWENSKTSVLGAVTRKGYPLAKLGNTRAAVNPDTATVDLNVVVDSGRPIAFGDFEITGTQ
                                                                                                                                     TYDNYKSHIQKIALSRGYFDGDFLVSRLEVRPSTQQAWWRLDYDSGERYRFGEVTFENAQ
                                                                                                                                                                                                           RYPEQIVSGLARFQPGTPYDLDLLLDFQQALEQNGHYSGASVQADFDRLQGDRVPVKVSV
                                                                                                                                                                                                                                         211 -IREDYLRNMINFNKGOPYLINDLSTLTNNYTSSNWPSSVLMQPVLDE-EHKIVNVDVLL
                                                                                                                                                                                                                                                                                                            294 TEVKRHKLETGIRLDSEYGLGGKIAYDYYNLFNKGYIGSVVWDMDKYETTLAAG----I
                                                                                                                                                                                                                                                                                                                                            349 SOPRNYRGNYWTSNVSYNRSTTQNLEKRAFSGGIWYVRDRAGIDARLGAEFLAEGRKIPG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                  329 KNPLNYYFYSAGLENENKNDTESFASSL--SAIRYWNHEAGWQHSLGLRVRYD----
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     SDIDLGNSHATML---TASWKRQLLNNVLHPENGHYLDGKIGTTLGT--FLSSTALIRTS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        464 ARAGYFFT-PENKKLGTFIIRGOAGYTVARDNADVPSGLMFRSGGASSVRGYELDSIGLA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        523 GPNGSVLPERALLVGSLEYQLPFTRTLSGAVFHDMGDAAANFKRMKLKHGSGLGVRWFSP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        97;
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Ralstonia solanacearum (Pseudomonas solanacearum).
Bacteria; Proteobacteria; beta subdivision; Ralstonia group;
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01-MAR-2002 (TrEMBLrel. 20, Last sequence update)
01-JUN-2002 (TrEMBLrel. 21, Last annotation update)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Putative outer membrane signal peptide protein. RSC1412 OR RS05280.
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InterPro; IPR0001184; Bac_surfAg_D15.
Pfam: PF01103; Bac_surface_Ag; IPR081FF; PS000601; ADH_SHORT; UNKNOWN_1.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 583 LAPFSFDIAYGHSD----KKIRWHISLG 606
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              MEDLINE-21681879; PubMed-11823852;
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Q8XZI3
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                                                                                                                                                                                                                                                                                                                                                                                                                                               : : | | : : | 344 LD------YSAGILFAKPGAFGPASTFTASVKAAIVDP 375
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        483 RCQ--AGYTVARDN-ADVPSGLMFRSGGASSVRGYELDSIGLAGPNGSVLPERALLVGSL 539
----TVHITPGPRTKIANVGVAILGDILSDGNLAEYYRNALENMOOPVGSDFDQDSW 175
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        433 VLHPENG------HYLDGKIGTTLGTFLSSTALIRTSARAGYFFTPENKKLGTFII 482
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       376 DAYSAKTVTAAAGAAFELSPEDTFSVGAEVGWADVDDAFGSNSYITAALPFEYVRDARDD
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        122 DGOPVPVVVRVAPGP-----AFTLGTVRLEGDAARL------DPAAYDLKRGAR
                                                                                                176 ENSK-----TSVLGAVTRKGYPLAKLGNTRAAVNPDTATVDLNVVVDSGRPIAFGDFEI
                                                                                                                                                                                                      230 TGTQRYPEQIVSGLARFQPGTPYDLDLLLDFQQALEQNGHYSGASVQADFDRLQGD-RVP
                                                                                                                                                                                                                                                         225 SGARTVDPDFVKDYSRLNHGRPYSPENIRKAAERLRQLNVFSSVTIN-EADGLAPDGTIP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               390 -----GIDARLGAEF-----LAEGRKIPGSDID----LGNSHAT-MLTASWKRQLLNN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           540 EYQLPFTRTLSGAVFHDMG----DAAANFKRMKLKHGSGLGVRWFSPLAPFSFDIA 591
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Pm70.";
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Pasteurella,
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7106 MW; 00895174DED58283 CRC64;
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MAY B.J., Zhang Q., Li L.L., Paustian M.L., Whittam T
MAY B.J., Zhang Q., Li L.L., Paustian M.L., Whittam T
"Complete genomic sequence of pasteurella multocida i
Proc. Natl. Acad. Scl. U.S.A. 98:3460-3465(2001).
EMBL; AE006218; AAK03893.1; -
InterPro; IPR000184; Bac_surfAq_D15.
InterPro; IPR00192; HLH_Dasic.
InterPro; IPR00192; HLH_Dasic.
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Last annotation update)
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25.0%; Pred. No. 4e-13;
ive 88; Mismatches 292;
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PROSITE; PS00038; HELIX_LOOP_HELIX; UNKNOWN_1.
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                                                                                                                                                                        DINITTEDVPCMSDQVDVNVNVTERPTGQISLGVGFSSTDKLVLSAGIRQDNVFGSGTSL 462
                                                                                                                                                                                                                                                           TMLTASWKROLLNNVLHPENGHYLDGKI ----GTTLGTFLSSTALIRTSARAGY ---FF 470
                                                                                                                                                                                                                                                                                                                                                              TPENKKLGTFIIRGQAGYTVARDNADVPSGLMFRSGGASSVRGYELDSIGLAGPNGSVLP 530
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                                                                        343 LTLVVDPGRRVYVRRVNVVGNSKTRDEVVRREMRQMESSWFDGEKLQLSQNRINRTGYFT 402
                                                                                                                                                           317
                                                                                                                                                                                                                        463 GLDVNTSKSNRTIS--VTQYDPYFT--VDGISRSTELYYRTYRPLYYRDQDAY-RIVQQG 517
                                                                                                         LNVVVDSGRPIAFGDFEITGTQRYPEQIVSGLARFQPGTPYDLDLLLDFQQALEQNGHYS 271
          99 VKTMLRSKGYF----SSKVSLT--EKDGAYTVHITPGPRTKIANVGVAILGDILSDGNL 151
                                                         152 AEYYRNALENWQQPVGSDFDQDSWENSKTSVLGAVTRKGYPLAKLGNTRAAVNPDTATVD 211
                        272 GASVQADFDRLQGDRVPVKVSVTE------VKRHKLETGIRLDSEYGLGGKI
                                                                                                                                                                                                          AYDYYNLFNKGYIGSVVWDMDKYETTLAAGISQP----RNYRGNYWTSNVSYNRSTTQN
                                                                                                                                                                                                                                                                                                                                    567 FPITIGWSKDQRDSALVPTRGRYQQANLEFGIPGGDLQYY------RAYYQHQYF
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01-JUN-2002 (TrEMBLrel. 21, Last sequence update)
01-JUN-2002 (TrEMBLrel. 21, Last sequence update)
01-JUN-2002 (TrEMBLrel. 21, Last annotation update)
Hypothetical protein Atu2615.
ATU2615 OR AGR.C_4742.
Agrobacterium tumefaciens (strain C58 / ATCC 33970).
Bacteria: Proteobacteria: alpha subdivision; Rhizobiaceae group;
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    IGPLKISMGFPIKRKAEDQTQRFQFQIGTAF 765
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NCBI_TaxID=176299;
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Goodner B., Hinkle G., Gattung S., Miller N., Blanchard M.,
Qurollo B., Goldman B.S., Cao Y., Askenazi M., Halling C., Mullin L.,
Houmiel K., Gordon J., Vaudin M., Iartchouk O., Epp A., Liu F.,
Wollam C., Allinger M., Doughty D., Scott C., Lappas C., Markelz B.,
Flanagan C., Crowell C., Gurson J., Lomo C., Sear C., Strub G.,
Geloome sequence of the plant pathogen and biotechnology agent
Agrobacterium tunefaciens C58.";
Science 294:233-2336(2001).
EMBL, AE009208, AaL43596.1; ALT_INIT.
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               282 LQGDRVPVKVSVTEVKRHKLETGIRLDSEYGLGGKIAYDYYNLFNKG----YIGSV----
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                                                                                                                                                                                                                                                                                                                                                                                                                                         DB 16; Length 641;
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                                                                                                                                                                                                                                                                                                                                                 Hypothetical protein; Complete proteome.
SEQUENCE 641 AA; 68281 MW; ECOAllDA3BBDF61E CRC64;
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01-OCT-2000 (TrEMBLrel. 15, Last sequence update)
01-JUN-2002 (TrEMBLrel. 21, Last annotation update)
Hypothetical protein Xf1231.
XF1231.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                290;
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22.6%; Pred. No. 2.9e-12;
iive 94; Mismatches 290
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MEDLINE=21608551; PubMed=11743194;
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                                 Bactería; Proteobactería; gamma subdivision; Xanthomonas group;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      9.7%; Score 306.5; DB 16; Length 617;
1larity 23.3%; Pred. No. 3.3e-11;
Conservative 89; Mismatches 232; Indels 139;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           EMBL, AE003957, AAP84041.1, ...
InterPro; IPR00184; Bac_surfAg_D15.
Pfam. PF01103; Bac_surface_Ag; 1.
Hypothetical protein; Complete proteome,
SEQUENCE 617 AA; 69579 MW; A875FA462C470D21 CRC64;
                                                                                                                                                                                                                         MEDLINE-20365717; PubMed-10910347;
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   fastidiosa
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--IIRGQAGYTVARDNAD 496
                                                                                                                                                                                                                                                                                            614
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  DFDQDSWENSKTSVLGAVTRKGYPLAKLGNTRAAVNPDTATVDLNVVVDSGRPIAFGDFE 228
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   502 LSRQSTQLWQKR----W----TYSIGAELTQTNER----SYDFSRSERLTRFYL 543
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         fosmid clone of Zymomonas mobilis ZM4."; EMBL/GenBank/DDBJ databases.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            24 ADLSENKAAGFALFKNKSPDTESVKLKPKFPVRIDTQDSEIKDMVEEHLPLITQQQE--- 80
                                                                                                                                                                                                                                                                114 SLT----EKDGAYTVHITPGPRTKIANVG-VAILGDILSDGNLAEYYRNALENWQQPVGS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       ----ADFDRLQGDRVPVKVSVTEVKRHKLETGIRLDSEYGL-----GGKIAYDYY---
                                    FPRNGSAATVLLRGGASALGSKSNFTQLHGQLRWFHGLGASSRLILRGEAGTTWASDLVA
                                                                                                                 VPSGLMFRSGCASSVRGYELDSIG--LAGPNGSVLPERALLVGSLEYQL-----PFTRTL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                81 -----EVLDKEQT------GFLAEEAPDNVKTMLRSKGYFSSKV
                                                                                                                                                                                                                                  550 SGAVFHDMGDAAANFKRMKLKH-GSGLGVRWFSPLAPFSFDIAYG--HSDKKIRWHISLG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   115 SDASEEKTA-----QNIEETTSVTLDPALSEPLPDLSHFMPDM-NEHVVLAKESDDLRY
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        228 ALSITPIEK-GOYNVRYD-----VNAGSIYKLGQINLTGSEEFPLRIARVALNIHRGD
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           ------NLFNKGY IGSVVWDMDK-YETTLAAGI SQPRNY RGNYWTSNVS
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Bacteria; Proteobacteria; alpha subdivision; Sphingomonadaceae;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Indels 168;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   229 ITGTQR--YPEQIVSGLARFQPGTPYDLDLLLDFQQALEQNGHYSGASVQ-----
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Length 738;
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Pfam. PP01103; Bac_surface_Ag; 1.
Hypothetical protein.
SEQUENCE 738 AA; 81140 MW; F169545D09168114 CRC64;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               01-NOV-1999 (TrEMBLrel. 12, Created)
01-NOV-1999 (TrEMBLrel. 12, Last sequence update)
01-JUN-2002 (TrEMBLrel. 21, Last annotation update)
Hypothetical 81.1 kDa protein.
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           9.5%; Score 300; DB 2; 23.9%; Pred. No. 1.1e-10;
                                                                                                                                                                                                                                                                                                                                                                                                                                        738 AA
449 TLGTFLSSTALIRTSARA---GYFFTPENKKLGTF--
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Lee H.J., Kang H.S.;
"Sequence analysis of 42Cll
Submitted (AUG-1998) to the
EMBL; AF088896; AAD21534.1;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Matches 165; Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                           PRELIMINARY;
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Zymomonas mobilis.
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         NCBI_TaxID=542;
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Db 439 DTNFGQVY	NESULA 13 QUYELS AC QUYELS AC QUYELS DT 01-MAR-2002 (TrEMBLrel. 20, Last sequence update) DT 01-MAR-2002 (TrEMBLrel. 20, Last sequence update) DT 01-MAR-2002 (TrEMBLrel. 20, Last annotation update) DE 00-ter membrane protein. GN BMEI1895. GN BMEI1895. GN BACCELIA meliterals. GN BACCELIA PROCEDIA. GN CALL TAXID-29459; RN   11 RP SEQUENCE FROM N.A. RC STRAIN-16M / ACC 23456 / BIOTYPE 1; RN MEDLINE-20020109; Pubmed-1176688; RA DelVecchio V.G., Kapatral V., Redkar R.J., Patra G., Mujer C., LOS T., RA Jablonski L., Larsen N., D'Souza M., Dernal A., Mazur M., Goltsman E., RA Jablonski L., Larsen N., Overbeek R.; RA Selkov E., Elzer P.H., Hagius S., O'Callaghan D., Letesson JJ., RA Hasalkorn R., Kyptpdes N., Overbeek R.; RA Hasalkorn R., Kyptpdes N., Overbeek R.; The genome sequence of the facultative intracellular pathogen	RT Brucella melitensis.";   RL   Proc. Natl. Acad. Sci. U.S.A. 99:443-448(2002).   RL   Proc. Natl. Acad. Sci. U.S.A. 99:443-448(2002).   DR   EMBL. AE009623; AALS3076.1;   KW   Complete protecome. SQ SEQUENCE 623 AA. 67227 WW; O7C43D0F6AD8F8FE CRC64;   SQ SEQUENCE 623 AA; 67227 WW; O7C43D0F6AD8F8FE CRC64;   Query Match   Best Local Similarity 20.4%; Pred. No. 3.5e-10; Best Local Similarity 20.4%; Pred. No. 3.5e-10; Matches 140; Conservative 106; Mismatches 248; Indels 193; Gaps 28   I.   I.   I.   I.   I.   I.   I.   I	0y         131
Qy       422 TASWKRQLLNNVLHPENGHYLDGKIGTTLGTFLSSTALIRTSARAGYFFTPENK 475         b       1   1   1   1   1   1   1   1   1   1	SULT 14  G95732 PRELIMINARY; PRT; G95732 PRELIMINARY; PRT; G1-MAR-2001 (TrEMBLrel. 16, Last so G1-DEC-2001 (TrEMBLrel. 19, Last so MCALTAIN COUTE NEWBORT 19, Last so NCBL_TAXID=64187; [1] SEQUENCE FROM N.A. GGel A.K., Rajagopal L., Nagesh N., "Xanthomonadin biosynthetic gene cl oryzae." Submitted (AUG-2001) to the EMBL/GE SUBMITTED SEGUENCE 593 AA; 66684 MW; OFFE	Query Match     9.2%; Score 292; DB 2; Length 593;       Best Local Similarity 23.3%; Pred. No. 2.6e-10;       Matches 146; Conservative 87; Mismatches 245; Indels 148; Gaps 26;       Qy 58 DTQDSEIKDMVEEHLPLITQQQEEVLDKEQTGFLAEEAPDNVKTMLRSKGYFSSKV 113         1 : ::	1::   : :

28;

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Best Local Sim.
Matches 138;
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:| | | ::| | ::| | 341 NSFDPKNYTYLLGASPAKPGVYTPDTDFVATLDAKREVLDAYTETSINAKTGFTGIFSDE 400
                                                                                                                                                                                                                                                        ASWKRQLLNNVLHPENGHYLDGKIGT----TLGTFLSSTALIRTSARAGYFFTPENKKLG 478
                                                                                                                                                                                                                                                                                                                               -----NNKPDPSSGFYLVGNIQPFYEFHYGNFATR------FTAEGRTYH 477
                                                                                                                                                                                                                                                                                                                                                                                                   TF-----IIRG--QAGYTVARDNADVPSGLMFRSGGASSVRGYELDSIGLAGPNGSVLP 530
                                                                                                                                                                                                                                                                                                                                                                                                                                            GFGQTDRVVLAGRLKVGSIVGGSIADLPPSQLFLAGGGGSVRGYGYRNIGVSAGNGNIIG 537
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |:|: : | : : | | | : | | | GRSLVEANGEVAGEKSFPDFSE-QMRVGVGGGLRYLTSLGPI 596
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    -- GYFSSKVSLTEKDG 120
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              121 AYTVHIT----PGP---RIKI-ANVGV--------AILGDILSDGNLAEYYR 156
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         NALENWQQPVGSDFDQDSWENSKTSVLGAVTRKGYPLAK-LGNTRAAVNPDTATVDLNV- 214
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          ELTKRYOD-----GVVTLQVA 376
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  ------VVDSGRPIAFGDFEITGTQRYPEQIVSGLARFQPGTPYDLDL 256
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   EGVVENISVRFRNKEGQDVNEQGQPI------RGRTQDYIITREVELKPGQVFNRNT 427
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              531 ERALLVGSLEYQLPFTRTLSGAVFHDMG----DAAANFKRMKLKHGSGLGVRWFSPLAPF
                                                                                                             -----NLEKRAFSGGIWYVRD--RAGIDARLGAEFLAEGRKIPGSDIDLGNSHATMLT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Kaneko T., Nakamura Y., Wolk C.P., Kuritz T., Sasamoto S., Watashaba A., Iriguchi M., Ishikwa A., Kawashima K., Kimura T., Kishida Y., Kohara M., Matsumoto M., Matsumo A., Muraki A., Nakazaki N., Shimpo S., Sugimoto M., Takazawa M., Yamada M., Yabada S., Complete genomic sequence of the filamentous nitrogen-fixing Complete genomic sequence of the filamentous nitrogen-fixing cyanobacterium Anabaena sp. strain PCC 7120.";
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Indels 200;
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EMBL, AP003588; BAB73968.1; -
InterPro; IPR000184; Bac_surfaq_D15.

Pfam: PF01103; Bac_surface_Ag; -
Bypothet.cal protein; Complete proteome.

SEQUENCE 833 AA; 89633 MW; 7F52B1E52FEA1BE9 CRC64;
                                                                                                                                                                             LSGALYANASQGHFVDDVFGKRDFTTAGLEGNL----LYDSR-----
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     01-MAR-2002 (TrEMBLrel. 20, Created)
1-MAR-2002 (TrEMBLrel. 20, Last sequence update)
01-JUN-2002 (TrEMBLrel. 21, Last annotation update)
Hypothetical protein Air2269.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Anabaena sp. (strain PCC 7120).
Bacteria; Cyanobacteria; Nostocales; Nostocaceae;
NCBI_TaxID=103690;
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ive 82; Mismatches 234;
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SEQUENCE FROM N.A.
MEDLINE-21595285; PubMed-11759840;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     PRT;
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Matches 153; Conserv
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01-MAR-2002 (
01-JUN-2002 (
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RP SEQUENCE FROM N.A.

RP SEQUENCE FROM N.A.

RX MEDIANE=ATCC 19089 / CB15;

RX MEDIANE=21173698; PubMed=11259647;

RA Mierman W.C., Feldblyum T.V., Laub M.T., Paulsen I.T., Nelson K.E.,

RA Bisen J., Heldelberg J.F., Alley M.R.K., Ohlen N., Maddock J.R.,

RA Beson T., Nelson W.C., Newton A., Stephens C., Phadke N.D., Ely B.,

RA DeBOy R.T., Dodson R.J., Durkin A.S., Gwlnn M.L., Haft D.H.,

RA Kolonay J.F., Smit J., Craven M.B., Khouri H., Shetty J., Berry K.,

RA Utterback T., Tran K., Wolf A., Vamathevan J., Ermolaeva M., White O.,

RA Salzberg S.L., Venter J.C., Shapiro L., Fraser C.M.;

"Complete genome sequence of Caulobacter crescentus.";

Proc. Natl. Acad. Scl. U.S.A. 98:4136-4141(2001).
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LLDFQQALEQNGHYSGASVQADFDRLQGDRVPVKVSVTEVKRHKLETGIRLDSEYGLGGK 316
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                                                                                                                                                                                                                                                                                 601
                                                                                                                                                                                                                                                                                                                                                                                                                                                      435 HPENGHYLDGKIGTTLGTFLSSTALIRTSARAGYF-----FTPENKKLGTFIIRGQAGY 488
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       767 VSGALFFDVGSDLGTSTRTAEVLNKSGSGYGYGLGVRVQSPLGPIRID--YGINDDGDSR 824
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                                                                                                               -----FNKGY IGSVVWDMDKYETTLAAGISQPRN
                                                                                                                                                                                                                                                               383 WY----VRDRAGIDARLGAEFLAEGRK----IPGSDIDLGNSHATMLTASWKRQLLNNVL
                                                                                                                                                                                                                                                                                                                                                                            QYQRVSTRDADGNLRKDGAVFDDNGNRTSEIVPLSFSGTGEDDLLLVQLGAQRDLRNNPL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            662 OPTSGSFL--RFGVDQSVPVGSGNIFLTRFRGSYSQYLPVKFTGFSKGPETIAFNIQGGT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       720 VL----GDLPPYEAFTLGGSNSVRGYEEGALGSG------RSFVQASVEYRFPVFSV
                                                 VOKDLORVFGTGLFEDVNVSLD-PGTDPTKVNVVVNVVERSSGSIAAGAGISSSSGLFGT
                                                                                                                                                                    VSYQQQNLNGRNQKLGAEVQLGERELLFDLRFTDPWIGG-----DPYRTSYTANIFRRS
                                                                                                                                                                                                                            354 YR------CNYWISN-------VSYNRSTTQNLEKRA---FSGGI
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     489 TVARDNADVPSGLMFRSGGASSVRGYELDSIGLAGPNGSVLPERALLVGSLEYQLPFTRT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     LSGAVFHDMGD-----AAANFKRMKLKHGSGLGVRWFSPLAPFSFDIAYG-HSDKKIR
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Caulobacter.
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628 Aa; 68203 Mw; 92DADI722CF82295 CRC64;
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Last annotation update)
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                                                                                                            317 IAYDYYNL-----
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SEQUENCE FROM N.A.
SEROGROUP B;
MEDLINE-2017555; pubMed-10710307;
Tettelin H., Saunders N.J., Heidelberg J., Jeffries A.C., Nelson K.E.,
Eisen J.A., Ketchum K.A., Hood D.W., Peden J.F., Dodson R.J.,
Nelson W.C., GWinn M.L., DeBoy R., Peterson J.D., Hickey E.K.,
Haft D.H., Salzberg S.L., White O., Fleischmann R.D., Dougherty B.A.,
Mason T., Ciecko A., Parksey D.S., Blair E., Cittone H., Clark B.B.,
Cotton M.D., Utterback T.R., Khouri H., Oin H., Vamathevan J.,
Smith H.O., Fraser C.M., Masignani V., Pizza M., Grandi G., Sun L.,
Smith H.O., Fraser C.M., Moxon B.R., Rappuoli R., Venter J.C.;
"Complete genome sequence of Neisseria meningitidis serogroup B strain
                                                                                                                                                                                                                                                                                                                                                                                                            198 NTRAAVNPDTATVDLNVVVDSGRPIAFGDFEITGTQRYPEQIVSGLARFQPGTPYDLDLL 257
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Neisseria meningitidis (serogroup B).
Bacteria; Proteobacteria; beta subdivision; Neisseriaceae; Neisseria.
                       SYQPLPNAGTKTVDEVLHIEPGRKIYVNEIHITGNNKTRDEVVRRELRQMESAPYDTSKL
                                                                                   383 QRSKERVELLGYFD--NVQFDAVPLAGTPDKVDLNMSLTERSTGSLDLSAGWVQDTGLVM
                                                                                                                                                    SAGVSQDNLFGTG--KSAALRASRSKTTLNGSLS----FTDPYFTADGVSLGYDIYGKAF
                                                                258 LDFQQALEQNGHYSGASVQADFDRLQG--DRVPVKVSVTEVKRHKLETGIRLDSEYGLGG
                                                                                                                                316 KIAYDYYNLFNKGYIGSVVWDMDKYETTLAAGISQPRNYRGNYWTS---NVSYN----
                                                                                                                                                                                               ----RSTTQNLEKRAFSGG-----IWYVRDRAGIDA------RLGAEFLAE
                                                                                                                                                                                                                             195 DPRKASTSVKQYKTTTAGGGVRMGIPVTEYDRVNFGLAAEHLTVNTYNKAPKRYADFIKQ
                                                                                                                                                                                                                                                           403 GRKIPGSDIDLGNSHATML---TASWKRQLLNNVLHPENGHYLDGKIGTTLGTFLSSTAL
                                                                                                                                                                                                                                                                                         555 YGKTDGAD----GSFKGLLYKGTVGWGRNKTDSALWPTRG-YLTG------VNAEI
                                                                                                                                                                                                                                                                                                                                                     500 ALPGSKLQYYSATHNOTWFFPLSKTFTLMLGGEVGIAGGYGRTKEIPPFENFYGGGLGSV
                                                                                                                                                                                                                                                                                                                                                                                          RGYELDSIGLAGPN----GSVLP----ERALLVGSLEYQLP---FTRTLSGAVFHDMGD
                                                                                                                                                                                                                                                                                                                                                                                                                                                       -----AAANFKRM-----KLKHGSGLGVRWFSPLAPFSFDIAY----G
                                                                                                                                                                                                                                                                                                                          460 IRTSARAGYFFTPENK-----KLGTFIIRGQAGYTVARDNA-DVPSGLMFRSGGASSV
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(TrEMBLrel. 15, Last sequence update)
(TrEMBLrel. 19, Last annotation update)
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Pred. No. 1.3e-07;
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Pfam; PF01103; Bac_surface_Ag; 1.
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Science 287:1809-1815(2000)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     594 HSDKKIRWHISLGTRF 609
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SEQUENCE 797 AA;
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01-OCT-2000
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                                                                                                                                                                                                                                                                                                                                                                                                                                                       230 TCTQRYPEQIVSGLARFQPGTPYDLDLLLDFQQALEQNGHYSGASVQ---ADFDRLQGDR 286
                                                                                                                                               293
                                                                                                                                                                                                       294 -PVVVTLSDRRARTIELGAGYSTSEGAGVDARWIRYNRQKRADTTTYALRFAKLEQRIGA 352
                                                                                                                                                                                                                                          GISQPRNYRGNYWTS-----NVSYNRSTTQNLEKRAFSGGIWYVRDRAGIDAR-LGAE 398
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     DNVKTMLRSKGYF----SSKVSLTEKDGAYTVHIT--PGPRTKIANVGVAILGDILSDG 149
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        233
                                                                                                                                                                                                                                                                       353 EISLP-----HWRRPQQTLKLNSSVFRNDTDAYNETGATVGVDLTRRQTTAYRTFGVS 406
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  NLAEYYRNALE-----GYPLAKLG 197
                ----QRAVAAMRLTEGEP 173
                                                                                                                                                                                                                                                                                                      F-----LAEGRKIPGSDIDLGNSHATML-TASWKRQLLINNVLHPENGHYLDG 444
                                                                                                                                                                                                                                                                                                                                        FDLSQTKEQVNRNGLIAGRKL------NLATLAGLAAYAWDFSDDILDPKRGWRLET 457
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                                                                                                                                 VPVKVSVTEVKRHKLETGIRLDSEYGLGGKIAYDYYNLFNKGYIGSVVWDMDKYETTLAA
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                                                                            GRSADVVGAEGRIVAQVAKLGYADVAAEPREVVVDHADRTVRPTFRIMAGELVRLNGVDV
                                                                                                                                                                                                                                                                                                                                                                      445 KIGTTLGTFLSSTALIRTSARAGYFFTPENKKLGTFI-IRGQAGYTVARDNADVPSGLMF
                                              177 NSKTSVLGAVTRKGYPLAKLGNTRAAVNPDTATVD-----LNVVVDSGRPIAFGDFEI
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   560 AAANF -- KRMKLKHGSGLGVRWFSPLAPFSFDIA----YGHSDKKIRWHISLGTRF 609
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   149;
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Manning D.S., Reschke D.K., Judd R.C.;
Manning D.S., Reschke D.K., Judd R.C.;
"Omp85 proteins of Neisseria gonorrhoeae and Neisseria meningi
are similar to Haemophilus influenzae D-15-Ag and Pasteurella
multocida Oma87.";
Microb. Pathog. 23:00-0(1998).
EMBL: U81959; AAC17600.1;
InterPro: JPR00148; Bac_surfAq_D15.
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Ouery Match 8.2%; Score 260.5; DB 2; Length 7 Best Local Similarity 22.6%; Pred. No. 4.1e-08; Matches 139; Conservative 86; Mismatches 242; Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Pfem; PF01103; Bac_surface_Ag; 1.
SEQUENCE 792 AA; 87868 MW; 90E32D24AA0513D8 CRC64;
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01-DEC-2001
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DNVKTMLRSKGYF----SSKVSLTEKDGAYTVHIT--PGPRTKIANVGVAILGDILSDG 149
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          SESKERVELLGYFD--NVQFDAVPLAGTPDKVDLNMSLTERSTGSLDLSAGWQDTGLVM 440
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                722 TYDDNSSSATGGRVQNIYGAGNTHKSTFTNELRYSAGGAVTWLSPLGPMKFSYAYPLKKK 781
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Proteobacteria; beta subdivision; Neisserlaceae; Neisseria.
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                                                                                                                                                                                                                                                                                                            NLAEYYRNALE-----GYPLAKIG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       316 KIAYDYYNLFNKGYIGSVVWDMDKYETTL------AAGISQPRNYRGNYW---
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               441 SAGVSQDNLFGTG - - KSAALRASRSKTTLNGSLSFTDPYFTADGVSLGYDVYGKAFDPRK
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          360 -TSNVSYNRSTTQNLEKRAFSGGIWYVRDRAGIDA-------RLGAEFLAEGRKI
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       -----GAANFKRM----KLKHGSGLGVRWFSPLAPFSFDIAY----G
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                                                                                                                                                                                                               Indels 144;
                                                                                                                                                       Length 797;
                                                                                      65DE47E00C9E1D1F CRC64;
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Last annotation update)
                                                                                                                                                 Query Match
8.0%; Score 253; DB 16; 1
Best Local Similarity 21.9%; Pred. No. 1.3e-07;
Matches 135; Conservative 89; Mismatches 248;
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   InterPro; IPR000184; Bac_surfAg_D15.
Pfam; PF01103; Bac_surface_Ag; 1.
Complete proteome.
SEQUENCE 797 AA; 88404 MW; 65DE4
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SEQUENCE FROM N.A.
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                                                          DNVKTMLRSKGYF----SSKVSLTEKDGAYTVHIT--PGPRTKIANVGVAILGDILSDG 149
                                                                                                                                                                                NLAEYYRNALE-----GYPLAKLG 197
                                                                                                                                                                                                                                        DINEVPRAELEKLLTMKPGKWYE------RQQMTAVLGEIQNRMGSAGYAYSEI- 322
                                                                                                                                                                                                                                                                                                                                                                                                                     258 LDFQQALEQNGHYSGASVQADFDRLQG--DRVPVKVSVTEVKRHKLETGIRLDSEYGLGG 315
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              316 KIAYDYYNLFNKGYIGSVVWDMDKYETTL------AAGISQPRNYRGNYW---- 359
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Bacteria: Proteobacteria: beta subdivision; Neisseriaceae; Neisseria.
NCBI_TaxID=65699;
   Mismatches 248; Indels 144; Gaps
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SEROGROUP A / SEROTYPE 4A;
MEDLINE-2022556; PubMed-10761919;
MEDLINE-2022556; PubMed-107619;
MEDLINE-2022566; PubMed-107619; PubMed-107619; PubMed-107619;
MEDLINE-2022566; PubMed-107619; PubMed-107619; PubMed-107619; PubMed-107
                                                                                                GRSKERVELLGYFD--NVQFDAVPLAGTPDKVDLNMSLTERSTGSLDLSAGWVQDTGLVM
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01-DEC-2001 (TrEMBLrel. 19, Last annotation update)
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EMBL; AL162752; CAB83401.1; -.
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              R.V.;
bacterium Aquifex
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Last sequence update)
Last annotation update)
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; Pred. No. 3.4e-07;
88; Mismatches 270;
           Feldman R.A., Short J.M., Olson G.J., Swanson *The complete genome of the hyperthermophilic
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InterPro; IPR000184; Bac_surfAg_D15.
Pfam; PF01103; Bac_surface_Ag; 1.
COMPLETE PROTECOME. 778 AA; 89998 MM; 9C1C1
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765 TNRS-RIHFVLGTFF 778
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                                                                                        Nature 392:353-358(1998)
                                                                                                                                                                                                                                                                                                                 Local Similarity
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Graham D.E., Overbeek R., Snead M.A., Keller M., Aujay M., Huber R.,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             258 LDFQQALEQNGHYSGASVQADFDRLQG--DRVPVKVSVTEVKRHKLETGIRLDSEYGLGG
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                                                                                                                                                                        Length 797;
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tive 89; Mismatches 248; Indels
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Bacteria; Aquificae; Aquificales; Aquificaceae; Aquifex.
NCBL_TaxID=63363;
Microb. Pathog. 23:0-0(1998).

EMBL; AF021245; AAC17599.1; -.

Interpro: IPR0000184; Bac_surfaq_D15.

Pfam; PF01103; Bac_surface_Ag; 1.

SEQUENCE 797 AA; 88539 MW; CF911B5F70B999CF CRC64;
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Last annotation update)
                                                                                                                                                                  7.9%; Score 251; DB 2;
21.9%; Pred. No. 1.7e-07;
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MEDLINE-98196666; PubMed-9537320;
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                                                                                                                                                                                                  Best Local Similarity 21.9%
Matches 135; Conservative
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        STRAIN-CO-92 / BIOVAR ORIENTALIS;
MEDLINE-21470413; PubMed=11586360;
MEDLINE-21470413; PubMed=11586360;
MEDLINE-21470413; PubMed=11586360;
MEDLINE-21470413; PubMed=11586360;
Prentice M.B., Sebaihia M., James K.D., Churcher C., Mungall K.L.,
Baker S., Basham D., Bentley S.D., Brooks K., Cerdeno-Tarraga A.M.,
Chillingworth T., Cronin A., Davies R.M., Davis P., Dougan G.,
Feltwell T., Hamilin N., Holroyd S., Jagels K., Karlyshev A.V.,
Leather S., Moule S., Oyston P.C.F., Quail M., Rutherford K.,
Simmonds M., Skelton J., Stevens K., Whitehead S., Barrell B.G.;
"Genome sequence of Yersinia pestis, the causative agent of plague.";
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                                                                                                                                                                                                                                                                                                                                                               163 VDLKLVFTEGVSAKIQQI-NIVGNH----SFTTDELISRFQ---LRDEVPWHNVVGDRKY
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                                                                                                                                                                                                                                                                                Length 795;
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EMBL, AJ414146; CAC89894.1; -.

InterPro; IPR000184; Bac_surfag_D15.

Pfam; PF01103; Bac_surfac_A9; Toteome,

Hypothetical protein; Complete proteome,

SEQUENCE 795 AA; 87838 MW; 8C4581328D38F821 CRC64;
                                                                                                                                                                                                                                                                              Ouery Match 7.8%; Score 246; DB 16; Best Local Similarity 21.2%; Pred. No. 3.5e-07; Matches 142; Conservative 105; Mismatches 273;
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EMBL: Ap002999; Baha4984.1; -. InterPro; IPR003975; Shal_channel.
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              74 LITQQQEEVLDKEQTGFLAEEAPDNVKTM--LRSKGYFSSKVSLTEKDGAYTVHITP---
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                                                                                                                                                                                                                                                                                                                                                                                                            Rhizobium loti (Mesorhizobium loti).
Bacteria; Proteobacteria; alpha subdivision; Rhizobiaceae group;
Phyllobacteriaceae; Mesorhizobium.
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83FB8C176201A444 CRC64;
                                                                                                         01-OCT-2001 (TrEMBLrel. 18, Created)
01-OCT-2001 (TrEMBLrel. 18, Last sequence update)
01-JUN-2002 (TrEMBLrel. 21, Last annotation update)
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20.9%; Pred. No. 5.2e-07;
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617
PRT;
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PRINTS; PRO1497; SHALCHANNEL.
Hypothetical protein; Complete prosperies 617 AA; 65759 WW; 831
                                                                                                                                                                                                                                                                                      Hypothetical protein mll1662
PRELIMINARY;
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Best Local Similarity
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RESULT Q98K30

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Similarity
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                                                                                                                  553 VFHDMG-
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501 ADRRFYSGGGGSVRGYAYQGIGPKDFTGQPIGGLSFFETSVEMRIAVTDTIGIVPFVDAG 560
                                                                                                                                                                                                                                                                                                           Latreille P.,
S., Layman D.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               163 VDLKLVFOEGVSAKIQQI-NIVGNH----AFSTEELISHFQ---LRDEVPWWNVVGDRKY 214
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     325 QPEINDADKTVKLRVNVDAGNRFYVRKIRFEGNDTSKDSVLRREMROMEGAWLGSDLVDQ 384
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    SDIDLGNSHATMLTAS -- WKRQLLNNVLHPENGH -- YLDGKIGTTLGTFLSSTALIRTSA 464
                                                                                                                                                                                                                                                                                                   McClelland M., Sanderson K.E., Spleth J., Clifton S.W., Latreille P., Courtney L., Porwollik S., Ali J., Dante M., Du F., Hou S., Layman D. Leonard S., Wiguyen C., Scott K., Holmes A., Grewal N., Mulvaney E., Waterston H., Florea L., Miller W., Stoneking T., Nhan M., Waterston R., Wilson R.K.;

"Complete genome sequence of Salmonella enterica serovar Typhimurium [Ing."]
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         VKLKPKFPVRIDTQDSE1KDMVEEHLPLITQQQEEVLDKEQTGFLAEEAP----- 96
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                                                                                                                                                                                                                  Bacteria; Proteobacteria; gamma subdivision; Enterobacteriaceae;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 145;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Length 804;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Matches 139; Conservative 101; Mismatches 287; Indels
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InterPro; IPR00104; Bac_surfAg_D15.
Pfam. PF01103; Bac_surface_Agy 1.
Hypothetical protein; Complete proteome.
SEQUENCE 804 AA; 89526 MW; 6197447548FAC41E CRC64;
                                                                                                                                01-MAR-2002 (TrEMBLrel. 20, Created)
01-MAR-2002 (TrEMBLrel. 20, Last sequence update)
01-JUN-2002 (TrEMBLrel. 21, Last annotation update)
Putative outer membrane antigen.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       DB 16;
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Pred, No. 4.6e-06;
                                       : | | : |:|:|:| | | | | 561 TVSTKSVPNFSDVKV--GAGVGLRYVTPFGPLRIDAA 595
                                                                                                                  AA.
                         DAAA----NFKRMKLKHGSGLGVRWFSPLAPFSFDIA
                                                                                                                                                                                                                                                                               STRAIN-LT2 / SGSC1412 / ATCC 700720;
MEDLINE-21534948; PubMed-11677609;
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                                                                                                                                                                                                                                                                                                                                                                                               Nature 413:852-856(2001)
                                                                                                                PRELIMINARY;
                                                                                                                                                                                                      Salmonella typhimurium
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                                                                                                               Q8ZRP0
                                                                                      RESULT 25
Q8ZRP0
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                                                                                                                                                                                                                                                                               RAGYFFTPENKKLGTFIIRGQAGYTVARDNADVPSGLMFRSGGASSVRGYELDSIG--LA 522
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               ---DAAANFKRMKLKHGSGLGVRWFSPLAPFSFDIAYG----H
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Chatconnet-Marton P.I., Givaudan A., Lanois A., Boemare N.E.;
"Photcorhabdus luminescens genomic region homologous to 4.0 minute
Scherichia coli region promotes pleiotropic phenotypes.";
Submitted (FEB-1999) to the EMBL/GenBank/DDBJ databases.
EMBL; AJ236920; CAB51929.1;
TherPor: IPR000184; Bac_surfAg_D15.
Pfam: PF01103; Bac_surfAg_D15.
SEQUENCE 797 AA; 88713 WW; 39E72E7ABD9C14F3 CRC64;
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                                  DTATYVPIDNDHKWVVLGRTRWGYGDGLGGKEMPFYENFYAGGSSTVRGFQSNTIGPKAV
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Photorhabdus luminescens (Xenorhabdus luminescens).
Bacteria; Proteobacteria; gamma subdivision; Enterobacteriaceae;
Photorhabdus.
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01-MAY-2000 (TrEMBLrel. 13, Last sequence update)
01-JUN-2001 (TrEMBLrel. 17, Last annotation update)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 261;
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20.4%; Pred. No. 5.7e-06;
ive 97; Mismatches 261
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Parkhill J., Dougan G., James K.D., Thomson N.R., Pickard D., Wain J., Churcher C., Mungall K.L., Bentley S.D., Holden M.T.G., Sebathia M., Baker S., Basham D., Brooks K., Chillingworth T., Connerton P., Cronin A., Davis P., Davies R.M., Dowd L., White N., Farrar J., Feltwell T., Hamlin N., Haque A., Hien T.T., Holroyd S., Jagels K., Krogh A., Larsen T.S., Leather S., Moule S., O'Gaora P., Parry C., Quail M., Rutherford K., Simmonds M., Skelton J., Stevens K.,
                                          491
                                                                                                                           382
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    ------ELNRFEFGI
                                                                                                                                                                                                                                                                                         383 WYVRDRAG-IDARLGAE-FLAEGRKIPGSDIDLGNSHAT---MLTASWKRQLLNNVLHPE
                                                                                                                                                                                                                                                                                                                                                                                                                                                               438 NGHYLDGKIGTTLGTFLSSTALIRTSARAGYFFTPENKKLGTFIIRGQAGY----TVA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          RDNADVPSGLMFRSGGASSVRGYELDSIGLAGP------NGS-----VLPERAL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                163 VDLKLVFQEGVSAKIQQI-NIVGNH----AFSTEELISHFQ----LRDEVPWWNVGDRKY
                                                                                                                           NLFNKGY IGSVVWDMDKYETTLAAGI SQPRNYRGNYWTSNVSYNRSTTQNLEKRAFSGGI
                                                                                                                                                                                                                                                                                                                                                                          530 GYTHINKIGNLTPYLQVENFLA----AQASNIDSGGNLLTDDFDINLSWTRNNLNNSYFPT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           535 LVGSLEYQLP-----FTRTLSGAVFHDMG---DAAANFKRMKLKHGS-----
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Bacteria; Proteobacteria; gamma subdivision; Enterobacterlaceae;
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Last sequence update)
Last annotation update)
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                                                                                                                                                                                                        NOFEASEAGIVDYTNESYGTSLTWGF--PFD------
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Pfam; PF01103; Bac_surface_Ag; 1.
Complete proteome.
SEQUENCE 803 AA; 89466 MW; RHPRAG
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MEDLINE=21534947; PubMed=11677608;
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        574 ----GLGVRWFSPLAPFSFDIA 591
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Outer membrane protein.
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NCBI_TaxID=601;
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STRAIN=EL TOR N16961 / SEROTYPE 01;

MEDLINE-20406833; PubMed=10952301;

Meldelberg J.F., Eisen J.A., Nelson W.C., Clayton R.A., Gwinn M.L.,

Dodson R.J., Haft D.H., Hickey E.K., Peterson J.D., Umayam L.A.,

Gill S.R., Nelson K.E., Read T.D., Tettelin H., Richardson D.,

McDonald L., Utterback T., Fleischmann R.D., Nierman W.C., White O.,

Salzberg S.L., Smith H.O., Colwell R.R., McKalanos J.J., Venter J.C.,

Fraser C.M.;
                                                                                                                                                                                                                                                                                                                                                                                                                ELDSIG------FTRTLSGAVF 554
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             RSNNIGPKAIYLYKDGSPKKESPSRDAVGGNAMAVASLELITPTPFLDSKYSNSVRTSFF 722
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            277 ADFDR----LQGDRVPVKVSVTEVKRHKLETGIRLDSEY------GLGGKIAYDYY 322
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                                                                            397 AEFLAEGRKIPGSDIDLGNSHATMLTASWKRQLLNNVLHPENG--HYLDGKIGTTLGTFL
                                                                                                                                                             562 AEFKADD-------FALTMGWTYNNLDRGFFFTSGVKSTLNGKV-TIPG---
                                                                                                                                                                                                                                                                                                                           SDNEFYKVTLDTSAYYPINDDRTWVILGRSRLGYGDGLGGKELPFYENFYAGGSSTVRGF
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NCBI_TaxID=666;
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                                                                                                                                                                                                                                              SSTALIRTSARAGYFFTPENKKLGTFIIRGQAGYTVARDNADVPSGLMFRSGGASSVRGY
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             555 HDMG-----DAAA-----NFKRMKLKHGSGLGVRWFSPLAPFSFDIA 591
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 GNTRAAVNPDTATVDLNVVVDSGRPIAFGDFEITGTQRYPEQIV-----
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Last sequence update)
Last annotation update)
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5.7e-06;
ches 225;
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Matches 135; Conservative
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Takemoto K., Mori H., Murayama N., Kataoka K., Yano M., Itoh T., Yamamoto Y., Inokuchi H., Miki T., Hatada E., Fukuda R., Ichihara S., Mizuno T., Makino K., Nakata A., Yura T., Sampel G., Mizobuchi K.; Systematic sequencing of the Escherichia coli genome: Analysis of the 4.0 - 6.0 min (189,987 - 281,416bp) region.; Submitted (FEB-1996) to the EMBL/GenBank/DDBJ databases.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   MEDLINE-94261430; PubMed-8202364;
Fujita N., Mori H., Yura T., Ishihama A.;
Eystematic sequencing of the Escherichia coli genome: analysis of the
2.4.4.1 min (110,917-193,643 bp) region.";
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                377 AFSGGI----WYVRDRAGIDARIG-----AEFLAE-------GRKIPGSDIDLG 414
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | : | | | : | | | | | DHLWVVSAKASAGYANGFGNKRLPFYQTYTAGGIGSLRGFAYGSI---GPNAIYQGQNNK 672
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                673 FNKISSDVIGGNAIATASAELIVPTPFVSDKSQNTVRTSLFVDAASVWNTKWKSDKNGLE 732
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          NSHATMLTASWKRQLLNNVLHPENGHYLDGKIGTTLGTFLSSTALIRTSARAGYFFTPEN 474
                                                                                         324 LFNKGYIGSVVWDMDKYETTLAAGISQPR-----NYRGNYWTSNVSYNRS-TTQNLEKR
                                                                                                                                                                                                                                                                                                                                                        506 TYGSNVTLGFPVNENNSYYVGLGHTYNKISNFALEYNRNLYIQSMKFKGNGIKTNDFD--
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                                                                                                                                                  -TATVDLANVVVDSGRPIAFGDFEITGTQRYPEQIVSGLARFQPGTPYDLDLLLDFQQALE
                                                                                                                                                                                              328 ANKTLAITFVVDAGRRLTVHQLRFEGNTVSADSTLRQEMRQQEGTWYNSQLVELGKIRLD
                                                                                                                                                                                                                                         ONGHYSCASVQADFDRLQG - - DRVPVKVSVTEVKRHKLETGIRLDSEYGLGGKIAYDYYN
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                                                             NLAEYYRNALENWQQPVGSDFDQDSWENSKTSVLGAVTRKGYPLAKLGNTRAAVNPD---
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01-MAY-2000 (TrEWBLrel. 13, Last sequence update)
01-DEC-2001 (TrEWBLrel. 19, Last annotation update)
Hypothetical 87.9 kDa protein.
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Takemoto K., Mori H.,
Yamamoto Y., Inokuchi
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SEQUENCE FROM N.A.
STRAIN-K12;
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SEQUENCE FROM N.A.
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Cosmore S.M., Yang Y., Coleman D.C., Shortreed J.M., England D.M., Klein M.H.;
Klein M.H.;
The gene encoding outer membrane protein D15 is highly conserved amongst Heemophilus influenzae species and may be part of an operon.";
Submitted (JUN-1996) to the EMBL/GenBank/DDBJ databases.
EMBL; U60831, AAB619691, ...
InterPro: IPR000184; Bac_surfAg_D15.
Pfam: PF01103; Bac_surfAg_D15.
SEQUENCE 792 AA; 87378 WW; 84BECB2DC4814C7F CRC64;
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                                                                                                                                         326 PEINDADKTVKLRVNVDAGNRFYVRKIRFEGNDTSKDSVLRREMROMEGAWLGSDLVDOG
                                                                                                                                                                                                                                                                                                          | | | : | : | : | 444 VQQDNWLGTGYSVGINGTKNDYQTYSELSVTNP-----YFTVDGVSLGGRIFYNDFEAD
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                                                                                                    201 AAVNPDTATVDLNVVVDSGRPIAFGDFEITGTQRYPEQIVSGLARFQPGTPYDLDLLLDF
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                                                                                                                                                                                                                                                                              319 YDYYNLFNKGYIGSVVWDMDKYETTLAAGISQPRNYRGNYWT-------
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21.2%; Pred. No. 1.8e-05;
tive 85; Mismatches 253; Indels 138;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Haemophilus influenzae.
Bacteria; Proteobacteria; gamma subdivision; Pasteurellaceae;
Haemophilus.
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01-JAN-1998 (
01-DEC-2001 (
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  Yamanaka K., Ogura T., Niki H., Hiraga S.;
"Identification and characterization of the smbA gene, a suppressor of
the mukb null mutant of Escherichia coll.";
J. Bacteriol. 174:7517-7526(1992).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      MEDINE-91100302; PubMed-1987124;
Dicker I., Seetharam S.;
"Cloning and nucleotide sequence of the firA gene and the firA200(ts) allele from Escherichia coli.";
J. Bacteriol. 173:334-344(1991).
                                                                                                                                                                                                                                                                                                                                                                                                    Smallshaw J., Kelln R.; "Cloning, nuclectide sequence and expression of the Escherichia coli K-12 pyrH gene encoding UMP kinase."; Genetics 11:59-65(1992).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Janosi L., Shimizu I., Kaji A.;
"Ribosome recycling factor (ribosome releasing factor) is essential
for bacterial growth";
Proc. Natl. Acad. Sci. U.S.A. 91:4249-4253(1994).
                                                                                            An G., Bendiak L., Mamelak A., Friesen J.; Cyganization and nucleotide sequence of a new ribosomal operon in Escherichia coll containing the genes for ribosomal protein S2 and elongation factor 7s.";
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            MEDLINE-90062117; PubMed-2684966; Ichlkawa S., Kaji A.; "Molecular cloning and expression of ribosome releasing factor."; J. Biol. Chem. 264:20054-20059(1989).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Icho T., Sparrow C.P., Raetz C.R.H.;
Molecular cloning and sequencing of the gene for CDP-diglyceride
synthetase of Escherichia coli ";
J. Biol. Chem. 260:12078-12083(1985).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Shimizu I., Kaji A.;
"Identification of the promoter region of the ribosome-releasing
factor cistron (frr).";
J. Bacteriol. 173:5181-5187(1991).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Hirvas L., Koski P., Vaara M.;
"The ompH gene of yersinia enterocolitica: cloning, sequencing,
expression, and comparison lwth known enterobacterial ompH
Nucleic Acids Res. 22:1637-1639(1994).
                                                                                                                                                                          Nucleic Acids Res. 9:4163-4172(1981).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   MEDLINE-91123198; PubMed-1991717;
                                                        STRAIN-K12;
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                                                                                                                                                                                                                                   STRAIN=K12;
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Dentification and sequence of the drpA gene from Escherichia coli."; Bacteriol. 172:281-286(1990).
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Gervais F.G., Drapeau G.; "Identification of rcsF, a new "Identification, cloning, and characterization of rcsF, a new regulator gene for exopolysaccharide synthesis that suppresses the division mutation fts2841n Escherichia coli K-12."; J. Bacteriol. 174:8016-8022(1992).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Coleman J., Raetz C.;
First committed step of lipid A biosynthesis in Escherichia coll:
sequence of the lpxA gene.";
J. Bacteriol. 170:1268-1274(1988).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          MEDLINE-94124004; PubMed-7904973; Allikmets R., Gerrard B., Court D., Dean M.; Cloning and organization of the abc and mdl genes of Escherichia coll: relationship to eukaryotic multidrug resistance."; Gene 136:231-236(1993).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       MEDLINE-90370122; PubMed-2203971;
Eriani G., Delarue M., Poch O., Gangloff J., Moras D.;
"Partition of tRNA synthetases into two classes based on mutually
exclusive sets of sequence motifs.";
Nature 347:203-206(1990).
                                                                                             Crowell D., Reznikoff W., Raetz C.; "Nucleotide sequence of the Escherichia coll gene for lipid A
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Li S., Cronan J.; "The genes encoding the two carboxyltransferase subunits of
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            (rrnH) in E. coli.";
Submitted (MAR-1996) to the EMBL/GenBank/DDBJ databases.
                                                                                                                                                                                                                                                                                                                                          Tomasiewicz H.G., McHenry C.S.; "Sequence analysis of the Escherichia coli dnaE gene."; J. Bacteriol. 169:5735-5744(1987).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Escherichia coli acetyl-CoA carboxylase.";
J. Biol. Chem. 267:16841-16847(1992).
                                                                                                                                                      disaccharide synthase.";
J. Bacteriol. 169:5727-5734(1987).
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STRAIN-K12;
MEDLINE-88058791; PubMed-3316192;
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BEDLINE-90094229; PubMed-1688424;
Zhou Z., Syvanen M.;
"Identification and sequence of tl
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Nature 406:959-964(2000)
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                                                                                                                                                                                                       Young R.A., Steitz J.A.; "Complementary sequences 1700 nucleotides apart form a ribonuclease III cleavage site in Escherichia coli ribosomal precursor RNA."; Proc. Natl. Acad. Sci. U.S.A. 75:3593-3597(1978).
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             Condon C., Philips J., Fu Z., Squires C., Squires C.; "Comparison of the expression of the seven ribosomal RNA operons Escherichia coli.";
                                                                                                                                                                                                                                                                                                                                     Escherichia coli
                                                                                                                                                                                                                                                                                                                                                                                       6.8%; Score 217; DB 2; Length 785;
20.5%; Pred. No. 2.4e-05;
Live 93; Mismatches 253; Indels 148;
                                                                                                                         coli.";
                                                                                                      Nakayashiki T., Adachi T., Miki T., Inokuchi H.: "Nucleotide sequence of the rrnH gene from Escherichia co
Submitted (MAR-1996) to the EMBL/GenBank/DDBJ databases.
                                                                                                                                                                                                                                                                                                                   Cormack R., Mackie G.;
"Structural requirements for the processing of
"Structural requirements for the processing of
"Dissomal RNA by Rhase E in vitro.";
J. Mol. Biol. 228:1078-1090(1992).
                                                                                                                                                                                                                                                                                         STRAIN-K12;
MEDLINE-93116053; Pubmed-1474579;
MEDLINE-93011013; PubMed-1396599;
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             152 AEYYRNALENWOOPVGSDFDQDSWENSKTSVLGAVTR-----KGYPLAKLGNTRAAVN 204
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             453 FLSSTALIRTSARAGYFFTPENKKLGTFIIRGQAGYTVARDNAD-VPSGLMFRSGGASSV 511
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     105 SKGYFSSKVSLTEKDGAYTVHITPGPRTKIA-----NVG-----VAILGD-ILSDGNL 151
                                                                                                                                                                                                                                                                                                                                                                                                                                                  STRAIN-ATCC 15692 / PAO1;
MEDLINE-2043733; PubMed=10984043;
StOVEN C.K., Pham X.O.T., Erwin A.L., Mizoguchi S.D., Warrener P., Hickey M.J., Brinkman F.S.L., Hufnagle W.O., Kowalik D.J., Lagrou M. Garber R.L., Goltry L., Tolentino E., Westbrock-Wadman S., Yuan Y., Brody L.L., Coulter S.N., Polger K.R., Kas A., Larbig K., Lim R.M., Smith K.A., Spencer D.H., Wong G.K.-S., Wu Z., Paulsen I.T., Reizer J., Saler M.H., Hancock R.E.W., Lory S., Olson M.V.; "Complete genome sequence of Pseudomonas aeruginosa PAO1, an
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     SVGFAQSAGLILGGSISQN--NFLGTGNKVSIGLTRSEYOTRYNFGFVDP-----YWTV
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   DGVSLGYNAFYRKTDYDELDVDVAS----YSVNSLGAGMSIGYPISETSRLTYGLSVQRD
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        308 TRRLGNEGYTFANVNGVPEAHDDDKTVSVTFVVDPGKRAYVNRINFRGNTKTEDEVLRRE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         -----DLLLDFQQA-LEQNGHYSGASVQADFDRLQGDRVPVKVSVTEVKRHKLET
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    GIRLDSEYG--LGGKIAYDYYNLFNKGYIGSVVWDMDKYETTLAAGISQPRNYRGNYWT-
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  ----NSHATMLTAS--WKRQLLNNVLHPENGHYLDGKIGTTL-GT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        536 QIDTGRYTVDEIYDFLDKEGDNFTNFKASIGWSESTLNKGVLATRGHSQSLTLETTLPGS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       PDTATVDLNVVVDSGRPIAFGDFEITGTQRYPEQIVSGLARFQPG-----TPYDL-
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Indels 209;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           6.8%; Score 215.5; DB 16; Length 797; 20.0%; Pred. No. 3.1e-05;
                                                                                                                                                                                                                                                                                 Bacteria; Proteobacteria; gamma subdivision; Pseudomonadaceae;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         717F9EF15BC89476 CRC64;
                                                          (TrEMBLrel. 16, Created)
(TrEMBLrel. 16, Last sequence update)
(TrEMBLrel. 18, Last annotation update)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    83; Mismatches 240;
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   797
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InterPro: IPR000184; Bac_surfAg_D15.
Pfam; PF01103; Bac_surface_Ag; 1.
Complete proteome. 797 AA; 88286 MW; 717F91
PRT;
                                                                                                                                                                        Probable outer membrane protein.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Matches 133; Conservative
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Created)
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Pfam; PF01103; Bac_surface_Ag; 1.
Complete proteome.
SEQUENCE 769 AA; 85938 MW: 7H12A
                                                                                                                                                                                                                                                                                                                                      01-JUN-2001 (TrEMBLrel. 17, 01-JUN-2001 (TrEMBLrel. 17, 01-MAR-2002 (TrEMBLrel. 20,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Query Match 6.6%
Best Local Similarity 22.1%
Matches 145; Conservative
                                                                                                                                                                                                                                                                                                                PRELIMINARY;
                                                                                                                                                                                                                                                                                                                                                                                Outer membrane protein
                                                                                                                                                                                                                                                                                                                                                                                                                                                 NCBI_TaxID=155892;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       cc1915;
                                                                                                                                                                                                                                                                                                                                                                                                                                      Caulobacter,
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                                                                                                            274 -----GGRTKPDFLRQQL-KLQPGQVFQENIVKQDVQQLYRTGLFQSVNVAFAGDATKL 326
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              161 TTPSGLNVVYQVQPVIVRSLQLTGAKALTYSVAQPRFQSQIGKPISPEGLKQAVAQVNQW 220
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              284
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       --GY-----IGSVVWDMDKY-----ETTLAAGISQPRNYR 355
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 76 TQQQEEVLD---KEQTGFLAEEAPDNVKTMLR-----SKGYFSSKVSLTEKDGAYTVH 125
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          115 TPELOEIIRQVIKTOTG-----GDTSQTQLQRDVAAILETGLFAS-----ANVNSR 160
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      126 ITPGPRTKIANVGVAILGDILSDGNLAEYYRNALENWQQPVGSDFDQDSWENSKTSVLGA 185
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   221 YADNGYNLARVLSIEPNRQGILNINVAEGLVSDIKFRFVNDDGKTIDSN-----GNPV-- 273
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Gaps
                                                                                                                                                                                                                                                                                                                                                                                     N 14)

N 14)

N SEQUENCE FROM N.A.

N SEQUENCE 7. N.A.

NEDLINE-21595285; PubMed-11759840;

N REDLINE-21595285; PubMed-11759840;

N Ranabo A., Iriguchi M., Ishikawa A., Kawashima K., Kimura T., Makzaki M., Shihida Y., Kohara M., Matsumoto M., Matsumo A., Muraki A., Nakazaki M., Shihido S., Sugimoto M., Takazawa M., Yamada M., Anakazaki M., Tabata S., Sugimoto M., Takazawa M., Yamada M., Asuda M., Tabata S., Sugimoto M., Takazawa M., Yamada M., Anada M., Pasuda M., Pasuda M., Pasuda M., Pasuda M., Pasuda M., Pasuda M., Ranabaena sp. strain PCC 7120.";

N Resistant PRO00377; DNA_119036.

N InterPro; PRO00977; DNA_119036.

N Hypothetical protein; Complete proteome.

N SEQUENCE 676 AA; 72411 MW; CS779633037D1223 CRC64;
512 RGYELDSIG------LAGPNGSVL---------PE----RALLVGSLE--Y
                                                         542 QLPFT---RTLSGAVFHDMGDA------AANFKRMKLKHGSGLGVRWFSPLAPF
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            GDFEITGTQRYPEQIVSGLARFQPGTPYDLDLLLDFQQALEQNGHYSGASVQADFDRLQG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             DTKFISPYRDTNSDRLGYTVNAFRRREISETFDDEIKLANGDKVREGKVGTGISLQRPID
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        VTRKGYPLAK------LGNTRAA------VNPDTATVDLNVVVDSGRPIAF
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  DRVPVKVSVTEVKRHKLETGIRLDSEYGLGGKIAYDYYNLFNK--------
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             6.6%; Score 211; DB 16; Length 676;
20.9%; Pred. No. 4.5e-05;
ive 85; Mismatches 248; Indels 166;
                                                                                                                                                                                                                                                                                                                                      Anabaena sp. (strain PCC 7120).
Bacteria; Cyanobacteria; Nostocales; Nostocaceae; Nostoc.
                                                                                                                                                                                                                                                                   01-MAR-2002 (TrEMBLrel. 20, Created)
01-MAR-2002 (TrEMBLrel. 20, Last sequence update)
01-JUN-2002 (TrEMBLrel. 21, Last annotation update)
Hypothetical protein Alr4893.
                                                                                                                                                                                                                                           PRT;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Best Local Similarity 20.99
Matches 132; Conservative
                                                                                                                                                                                                                                             PRELIMINARY;
                                                                                                                                                                                                                                                                                                                                                      Bacterla; Cyanobac
NCBI_TaxID=103690;
                                                                                                                                                               771 SFSLA 775
                                                                                                                                                 SFDIA 591
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                                                                                                                                                                                                                                           Q8YMP0
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                                                                                                                                                                                                                 RESULT 32
Q8YMP0
                                                                                                                                                 587
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STRAIN-ATCC 19089 / CB15;
MEDLINE-21173698; bubmed-11259647;
MEDLINE-21173698; bubmed-11259647;
Micrman W.C., Feldblyum T.V., Laub M.T., Paulsen I.T., Nelson K.E., Eisen J., Heidelberg J.F., Alley M.R.K., Ohta N., Maddock J.R., Potocka I., Nelson W.C., Newton A., Stephens C., Phadke N.D., Ely B., DeBoy R.T., Douson R.J., Durkin A.S., Gwinn M.L., Haff D.H., Kolonay J.F., Smit J., Craven M.B., Khouri H., Shetty J., Berry K., Utterback T., Tran K., Wolf A., Vamathevan J., Ermolaeva M., White O., Salzberg S.L., Venter J.C., Shapiro L., Fraser C.M.;
"Complete genome sequence of Caulobacter creacentus.";
Proc. Natl. Acad. Sci. U.S.A. 98:4136-4141(2001).
                                                                                                                                                                                     - DLTTVSFSATKDQRDNPINPTQGSVV--RVSTEQSVPIGQGNISMNRLKADYSQYVPVN 540
                                                                                                                                                                                                                                                                                                                                                                                                                                                                       285
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              PRVYVDRIDIVGNTRTLDYVLRRELEVAEGDAYNRVLVDRSKNNMRRLGFFKEVEIE-DA 401
GNYWTSNVSYNRSTTQNLEKRAFSGGIWYVRDRAGIDARLGAEFLAEGRKIPGSDIDLGN 415
                                                                                                                                     474
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           61 DSEIKDMVEEHLPLITQQQEEVLDKEQTGFLAEEAPDN------VKTMLRSKGY 108
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        109 FSSKV--SLTE----KDG-AYTVHITPGPRTKIANVGVAILGDILSDGNLAEYYRNALEN 161
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Gaps
                                                                                                                                                                                                                                                                                     ----KKLGTFIIRGQAGYTVARDNADVPSGLMFRSGGASSVRGYELDSIGLAGPNGSVLP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              -- LPVRTGQLYEDERIEQATDALTFAAGAAGFAFVDV-RPRYVPNRETKTVDVVFQVREG
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                                        G--WNASLGFNYSRTS---------IRDRQGNITPTDAQ--GNPLSVSGTGVD---
                                                                                                                                     SHATMLTASWKRQLLNNVLHPENGHYLDGKIGTTLGTFLSSTALIRTSARAGYF-FTPEN
                                                                                                                                                                                                                                                                                                                          S41 IFNSQTPQVFALNVQAGTVL---GNLPPYETFNLGGSNSVRGYDAGNVGSG-----
                                                                                                                                                                                                                                                                                                                                                                                                                              ERALLVGSLEYQLPFTRTLSGAVFHDM- ----GDAA - ANFKRMKLKHGSGL----GVRW
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           233 FDFRVISSVAELAPDKNGFAVTYTLEEGPKYKFGKITVETELKKL-DGNLLAQI----
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Caulobacter crescentus.
Bacteria; Proteobacteria; alpha subdivision; Caulobacter group;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Indels 183;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      DB 16; Length 769;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                769 AA; 85938 MW; 7B12A1FEB6226F2B CRC64;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Last sequence update)
Last annotation update)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               6.6%; Score 210.5; DB 16; 22.1%; Pred. No. 6e-05; tive 82; Mismatches 247;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            769 AA.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    FSPLAPFSFDIAYGHSDK-KIRWHISLGTRF 609
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163 QQPVGSDFDQDSW----
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P73472;
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P73472
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  60 QDSEIKDMVEEHLPLIT------QQQEEVLDKEQTGFLAE----EAPDNVKTML 103
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                ---NSHATMLTA 423
                                                                                                             480 LVAGVNLYTFRYDLSEFAAYDTKSVGGDVRFGFPLTNDSSMSLRYTVRQDEVSVADSLCA 539
DRLQGDRVPVKVSVTEVKRHKLETGIRLDSEYGLGGKIAYDYYNLFNKGYIGSVVWDMDK 339
             PGSAPDRTSLRVKVEEQPTGELS-----SIDK 434
                                          340 YETTLAAGISQPRNYRGNYWTSNVSYNRSTTQNLEKRAFSGGIWYVRDRAGIDAR-LG-- 396
                                                                                                                                   SWKRQLLNNVLHPENGHYLDGKIG------TTLGTFL-----SSTALI 460
                                                                                                                                                                                          IGPRDISSSFNSMGAKLYAISTFELTVPTFLPEQYGIKAALFSDVGTAGLLDDVDRQRSP 711
                                                                                                                                                                                                                         IGLAGPNGSVLPERALLVGSLEYQ-----LPFTRTLSGAVFHDMGDAA------ 561
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Parkhill J., Wren B.W., Mungall K., Ketley J.M., Churcher C., Basham D., Chillingworth T., Davies R.M., Feltwell T., Holroyd S., Jagles K., Karlyshev A.V., Moule S., Pallen M.J., Penn C.W., Quail M.A., Raigandream M.A., Rutherford K.M., van Vliet A.H.M., Whitchead S., Barrell B.G., The genome sequence of the food-borne pathogen Campylobacter jejuni Nature 403:665-668(2000).

BMBL: AL139074; CABA75613.1; -.

BMBL: AL139074; CABA75613.1; -.

Prepro: PF00103; Bac_surface_A9; 1.
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Bacteria; Proteobacteria; epsilon subdivision; Campylobacter group;
                                                                                                                                                                                                                                                                                ----ANFK-RMKLKHGSGLGVRWFSPLAPFSFDIAYGHS----DKKIRWHISLGTRF 609
                                                                                                                                                                            RTSARAGYF - - FTPENKKLGTF1IRGQAGYTVARDNADVPSGLMFRSGGASSVRGYELDS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 210;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Length 739;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Indels
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       19 AYAPAADLSENKAAGFALFKNKSP-DTESVKLKPKF-PVRIDT----
                                                                                                                                                                                                                                                                                                                                                                    Created)
Last sequence update)
Last annotation update)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Query Match 6.5%; Score 206; DB 16;
Best Local Similarity 18.3%; Pred. No. 0.00011;
Matches 140; Conservative 102; Mismatches 312;
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                                                                                       ----AEFLAEGRKIPGSDIDLG----
                                                                                                                                                                                                                                                                                                                                                739
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SEQUENCE FROM N.A.
STRAIN-NCTC 11168;
MEDLINE-20150912; PubMed-10688204;
                                                                                                                                                                                                                                                                                                                                                                   01-0CT-2000 (TrEMBLrel. 15, 01-0CT-2000 (TrEMBLrel. 15, 01-DEC-2001 (TrEMBLrel. 19,
                                                                                                                                                                                                                                                                                                                                                PRELIMINARY;
                                                                                                                                                                                                                                                                                                                                                                                                      Outer membrane protein
                                                                                                                                                                                                                                                                                                                                                                                                                            Campylobacter jejuni
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      739 AA;
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NCBI_TaxID=197;
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280
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09PIZ8
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RSKGYFSSKVSLTEKDGAYTVHITPGPRTK-IANVGVAILGDILSDGNLAEYYRNALENW 162
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     ----DLGNSHATMLTASWKRQLLNNVLHPENGHYLDGKIGTTLGTFLSSTALIRTSARA 466
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    580 DQEFISSSSKFNFYQGLQDYIGYDLIYRYKASFYKVWDEGYLPINQRIYLGGIRSIRGFE 639
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      516 LDSIGLAGPNGSVLPERALLVGSLEYQLPFTR--TLSGAVFHDMGDAAA----NFKRMKL 569
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    640 SRTVSPKNOMGDEIGGTIAFANSVELSFPLIDRIKLRGSVFFDYGMIGRKNLDEIKRM-- 697
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MEDLINE=97061201; PubMed=8905231;
KANDELNE=97061201; PubMed=8905231;
KANDEKO T., Sato S., Kotanti H., Tanaka A., Asamizu E., Nakamura Y.,
Miyajima N., Hirosawa M., Sugiura M., Sasamoto S., Kimura T.,
Hosouchi T., Matsuno A., Muraki A., Nakazaki N., Naruo K., Okumura S.
Shimpo S., Takeuchi C., Wada T., Watanabe A., Yamada M., Yasuda M.,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Synechocystis sp. strain PCC6803. II. Sequence determination of the entire genome and assignment of potential protein-coding regions.";
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   'Sequence analysis of the genome of the unicellular cyanobacterium
                                                                                  13 EAKSYFDTIVEYKKK----TLENTDGLELEFIVNRGENIIIDNVHLSGAKKFSYSDIEPA
                                                                                                                                                                                                                                                                                                                                                                                                      427 GSSDGILLNASLSDTNIFGSGIKSSV--SVDKSDDTLSGRISLVNPRVLDSQYSLGGTLY
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   SNDYE-------WDNYSEKNYGFDITIGRQFARYYNVSLTYNLEQSDIYHLSPTL
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                                                                                                                                                                         -----ENSKTSVLGAVTRKGYPLAKLGNTRAAVNPDTATV
                                                                                                                                                                                                                                                       189 VVNKEKEFEMGWAWGRNDGKLKVFELSNDSSRIADEYMKKGYLDVQVSSPYLKTYTDTYQA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              23.2 -----TQRYPE-----FQ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           248 PGTPYDLDLLLDFQQALEQNGHYSGASVQADFDRLQGDRVPVKVSVTEVKRHKLETGIRL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         369 EGNLYNRTDLSESKNALKRTSYFDDVNIKE - EKVDDTHIDLIVDVKEASTGAISGGIGY
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   533 LRTGYELGKSIKSSITPAITFNDTDDYYLPRSG------IIASTSLEYAGLGG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                DSEYGLGGKIAYDYYNLFNKGYIGSVVWDMDKYETTLAAGIS--QPRNYRGNYWTSNVSY
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Bacteria; Cyanobacteria; Chroococcales; Synechocystis.
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01-FEB-1997 (TrEMBLrel. 02, Last sequence update)
01-JUN-2002 (TrEMBLrel. 21, Last annotation update)
Chloroplast import-associated channel IAP75.
IAP75 OR SLR1227.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              861 AA.
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EMBL: D90906: BAA17512.1; -.

Interpro: IPR000184: Bac_surfaq_D15.

TIGRPAMS: TIGR00992: 3a0901s031AP75; 1.
                                                                                                                                                                                                                                                                                                                                         211 DLNVVVDSGRPIAFGDFEITG----
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sequences of Chlamydia trachomatis MoPn and Chlamydia
                         pneumoniae AR39.";
Nucleic Acids Res. 28:1397-1406(2000).
EMBL: AE002320; AAF39354.1; -
TIGR; TC0512: -
                                                                       Interpro, IPR000184; Bac_surfAg_D15.
Pfam: PF01103; Bac_surface_Ag; 1.
Complete proteome.
SEQUENCE 792 AA; 88824 MW: 18387
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               579 ----- WFSPLAP 585
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                                                                                                                                               Query Match 6.3%
Best Local Similarity 22.0%
Matches 136; Conservative
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Q9PEI2
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K., Bass S.,
Dodson R.,
Salzberg S.L.,
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 GVDELFTLSFGASQDNRNNALQPTSGSLV--RFGAEQTIPVGTGNIMMTRLRGSYSYYIP 715
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              521 LAGPNGSVLPERALLVGSLEYQLPFTRTLSGAVFHDMGD-----AAANFKRM----KL 569
                                                                                                      76 TQQQEEVLDKEQTGFLAEEAPDNVKTMLRSKGYFSSKVSLTEKDGAYTVHITPGPRTKIA 135
                                                                                                                                  293 TQLQEDV--------NAIYATGYFSN-VRVAPSDTPLGVRVTFEVQANPV 333
                                                                                                                                                                                                               183 LGAVTRKGYPLAK-LGNTRAAVNPDTATVDLNVVVDSGRPIAFGDFEITGTQRYPEQIVS 241
                                                                                                                                                                                                                                                                     GLARFQPGTPYDLDLLDFQQALEQNGHYSGASVQADFDRLQG-----------284
                                                                                                                                                                                                                                                                                                                                                                                                                                                            598 GLGLTFFRPIADDVFAPPDWRLSAGFGYQNVRIENAAGALSPFSAPLNGFNSQPLSFSDY 657
                                                                              Gaps
                                                                                                                                                                                                                               334 FTGLNIRTVPETAEGKERILPQEVVDETFGEOYGKILNLRELQEGIKTINEWYSN----
                                                                                                                                                                                                                                                                                       285 DRVPVKVSVTEVKRHKLETGIRLDSEYGLGGKIAYDYYNLFNKGYIGSVVWDMDKYETTL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          473 ------ENKKLGTFIIRGQAGYTVARDNADVPSGLMFRSGGASSVRGYELDSIG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          136 NVGV------AILGDILSDGNLAEYYRNALENWQQPVGSDFDQDSWENSKTSV
                                                                                                                                                                                                                                                                                                                                                                             345 AAGISQPRNYRGNYWTSNVSYNRSTTQNLEKR----AFSGGIWYVRDRAGIDA----
                                                                                                                                                                                                                                                                                                                                                                                                     545 DVSFTDP-----WIGGDPFRTSYTANLFRRRIISLVFDGADSSIRTFNGFDSPRVVRT
                                                                                                                                                                                                                                                                                                                                                                                                                                  772 ----NG-----RSFFQATAEYRFPIIAAVGGALFVDYGSNLGSQGAVPGFPAIVRGLPGS
                                                                           77; Mismatches 254; Indels 179;
                                                   DB 16; Length 861;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  [1]
STRAIN-MOPN V. A.
STRAIN-MOPN / NIGG:
MEDLINE-20150255; PubMed-10684935;
MEDLINE-20150255; PubMed-10684935;
Read T.D., Brubham R.C., Shon C., Gill S.R., Heidelberg i. White O., Hickey E.K., Peterson J., Utterback T., Berry Linher K., Weidman J., Khouri H., Craven B., Bowman C., Gwinn M., Nelson W., DeBoy R., Kolonay J., McClarty G., Eisen J., Fraser C.M.;
                         92307 MW; 1C5DFFD394DA5B44 CRC64;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       01-OCT-2000 (TrEMBLrel. 15, Created)
01-OCT-2000 (TrEMBLrel. 15, Last sequence update)
01-UNY-2002 (TrEMBLrel. 21, Last annotation update)
00.cer membrane protein, putative.
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Bacteria; Chlamydiales; Chlamydiaceae; Chlamydia.
NCBI_TaxID=83560;
                                                 Score 202.5; DB Pred. No. 0.00023
                                                   6.4%;
                                                                              Matches 131; Conservative
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                          861 AA;
                                                  Query Match
Best Local Similarity
           Complete proteome.
SEQUENCE 861 AA
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                                                                                                                                                                                                                                                                                                                                                                                                                              DAVEEHLPLITQQQEEVLDKEQTGFLAEEAPDNVKTMLRSKGYFSSKVS---LTEKDG-- 120
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             121 AYTVHITPGPRTKIANV---GVAILGDILSDGNLAEYYRNALENWQQPVGSD---FDQDS 174
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   SLVINVDKGPLYTLGHVHIEGFTALSKRLLDKQLL------VGPNSLYCPEKV 310
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               523 GPNGSVLPERALLVGSLEYQLPFTRTLSGAVFHDMGDAAANFKRMKLKH---GSGLGVR- 578
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  535 TYGGNISTTYILNDK-LKYGMYY----RGSQTSLSLRKKTENPNKPGPDLD---SNKGFV
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                231 GTQRYPEQIVSGLARFQPGTPYDLDLLLDFQQALEQNGHYSGAS---VQADFDRLQGDR-
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Bacteria; Proteobacteria; gamma subdivision; Xanthomonas group;
Xylella.
NCBI_TaxID=2371;
                                                                                                                                                                                                                                                                                      Indels 174;
792 AA; 88824 MW; 18387EC3580F5666 CRC64;
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Last annotation update)
                                                                                                                               6.3%; Score 199; DB 16;
22.0%; Pred. No. 0.00034;
tive 76; Mismatches 232;
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Best Local Similarity
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01-MAR-2002 (
01-JUN-2002 (
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                                                                                                                                                                                                                                                                                                                                                                                                    258 LDFQQALEQNGHYSGASVQADFDRLQGDRVPVKVSVTEVKRHKLETGIRLDSEYGLGGKI 317
                                                                                                                                                                                                                                                                                                                                                                                                                                                                          551
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    552 AIIDYIDAVGORTFRAWRTELGWARDTRNDYFMPNLGMYQRIGAEVTLPGSTIKYYKINY 611
                                                                                                                                                                                                                                                                                                    164 LDRNRVDVTIAIKEGKAAKIRHINLIGTEKFNNKDVMSAWESKEHNWASWYRRDDQYSKE 223
                                                                                                                                                                                                                                                                                                                                             139 VAILGDILSDGNLAEYYRNALENWQQP-VGSDFDQDSWENSKTSVLGAVTRKGYPLAKLG 197
                                                                                                                                                                                                                                                                          Gaps
                                                                                                                                                                                                                                                                                       LFKNKSPDTESVKLKPKFPVR----IDTQDSEIKDMV-----EEHLPLITQQQEEVLDKE 86
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                                                                                                                                                                                                                                                                                                                                                                         198 NTRAAVNPDTATVDLNVVVDSGRPIAFGDFEITGTQRYPEQIVSGLARFQPGTPYDLDLL
                                                                                                                                                                                                                                                                                                                                                                                                                               318 AYDYYNLFNKGYIGSVVWDMDKYETTLAAGISQPRNYRGNYWTSN-----VSY
                                                                                                                                                                                                                                                                                                                                                                                                                                                                         SDFNAAQYNSKRMSGQTIFGIPITENDTVSWVI - - - - GADSNQITTF - - - - - PGSTPK
                                                                                                                                                                                                                                                                                                                                                                                                                                         131;
                                                                                                                                                                                                                                                           Match 6.2%; Score 197.5; DB 16; Length 784; Local Similarity 20.5%; Pred. No. 0.00042; Local 315; Conservative 105; Mismatchés 291; Indels 131;
                                                                                                                                                                                                                                                                          291; Indels
                                                                                                                                                                                                                                              784 AA; 87991 MW; 719331DD881E8192 CRC64;
             MEDLINE-20365717; Pubmed-10910347;
                                                                                                                                                                                                                                Pfam; PF01103; Bac_surface_Ag;
                                                                                                                                                                                                                                       Complete proteome.
SEOUENCE 784 AA:
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SEQUENCE FROM N.A.

STRAIN-16M / ATCC 23456 / BIOTYPE 1;

STRAIN-16M / ATCC 23456 / BIOTYPE 1;

STRAIN-20020109; PubMed-11756688;

DelVecchio V.G., Kapatral V., Redkar R.J., Patra G., Mujer C., Los T., Ivanova N., Anderson I., Bhattacharyya A., Lykidis A., Reznik G., Jablonski L., Larsen N., D'Souza M., Bernal A., Mazur M., Goltsman E., Selkov E., Bizzer P.H., Haglus S., O'Callaghan D., Letesson J.-J., Haselkorn R., Kyrpides N., Overbeek R.;

The genome sequence of the facultative intracellular pathogen Brucella melitensis.";
449 TLGTF--LSSTALIRTSARAGYFFTPENKKLGTFIIRGQAGYTVARDNADVPSGL----M 502
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662 FYAGGTNSVRGFRDNTLGPRSEVTALYNQGQPLGGSFKTVGSTEMYFPKLFDSPSARISA
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                                                                                                                                                          FRSGGASSVRGYELDSIGLAGP-----NGSVLPERALLVGSLE-----YQLPFTRTLS
                                                                                                                                                                                                                                                                                                            551 GAVFHDMGDAAANFKRMKLKHGSGLGVRWFSPLAP----FSFDIAYGHSDKKIRWHISLG
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   249 GTPYDL----DLLLDFQQALEQNGHYSGASVQADFDR-LQGDRVPVKVSVTEVKRHKLE-
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Brucellaceae; Brucella.
NCBL_TaxID=29459;
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Last annotation update)
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EMBL; AE009524; AAL52011.1; ...

InterPro; IPR000184; Bac_surfAg_D15.

Pfam; PP01103; Bac_surface_Ag; 1.

Complete proteome.

SEQUENCE 781 AA; 85918 MW; E3C7385CCR11DR?A
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303 ---TGIRLDSEYGLGGKIAYDYYNLFNKGYIGSV----VWDMDKYET----TLAAGISQPR- 352

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Wed Nov 13 10:43:46 2002

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MEDLINE-21295095; PubMed-11401984;
Thomas C.E., Cameron D.W., Elkins C.;
Thomas K.L., Lebuc I., Olsen B., Thomas C.E., Cameron D.W., Elkins C.;
"Cloning, Overexpression, Purification, and Immunobiology of an 85-
Infect. Immun. 69:4438-4446(2001).
EMBL; AR7208431; AR70345.1; -.
EMBL; PR329813, AR70345.1; -.
Enter Pr0: IPR000184; Bac_surface, Ag; I.
SEQUENCE 793 AA, 88661 WW; E4E9DB62A8F9903F CRC64;
                                                                 483
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  64 SONR-----FENVSAAREGOTLVIKVAERPLINNLTIKGNNAIPKNALEONLKANLIVA 117
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365 IEIRGNDKTRDYVIRREFDLNEGDAFNQVMVQRAKRRLEVLDFFQTVNISTAPG-SEPDQ
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                                                                                                                                                                   544 VQEKYDLFRGDAENYYAPALLEAAENSPWLRSSVSYSLTYSSIDDIKNPHDGLY--GKFI
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              SENKAAGFALFKNKSPDTESVKLKPKFPVR----IDTQDSEIKDMVEEHLPLITQQQ
                                                                                                              -----DLGNSHATML----TASWKR-----QLLNNVLHPENGHYLDGKIG
                                                                                                                                                                                                        TTLGTFLSSTAL1RTSARAGYFFTPENKKLGTF11RGQAGYTVARDNADVPSGLMFRSGG
                                                                                                                                                                                                                                  QEFAGLGGDAKYVKTTFKGNYYQTLSQEADIVGLLGVGAGYIHEFGDDGVRIFDLFKN-S
                                                                                                                                                                                                                                                             ASSVRGYELDSIG--LAGPNGS--VLPERALLVGSLEYQ-----LPFTRTLSGAVF----
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   80 EEVLDKEQTGFLAEEAPDNVKTMLR-----SKGYFSSKVSLTEKDGAYT----
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 FEGNNAFSYDELIKELEIKPNAPWWNIFESSKFOOOEYNKDIEILRDFYMDHGYAKFTLK
                                      -----NYRGNYWTSNVSYNRSTTQNLEKRAFSGGIWYVRDRAG-----
                                                                 VILVVDVVEKSTGEFSIGGGYTTGGESPGAQVEAAITERNFLGRGQYIRISAGAGQDDMR
                                                                                             -----IDSSDI-----
                                                                                                                                                                                                                                                                                                                    ----HDMGDAAANFKRMKLKHGSGLGVRWFSPLAPFSFDIAY----GHSDKKIRWHISLG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Indels 249;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Bacteria; Proteobacteria; gamma subdivision; Pasteurellaceae;
Haemophilus.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Length 793;
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01-DEC-2001 (TrEMBLrel. 19, Last sequence update)
01-MAR-2002 (TrEMBLrel. 20, Last annotation update)
Integral outer membrane protein.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       6.1%; Score 193.5; DB 2;
ilarity 19.2%; Pred. No. 0.00076;
Conservative 104; Mismatches 278;
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                                                                                           -----IDARLGAEFLAEGRK----
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TKF 781
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EMBL; ALS91787; CAC46081.1;

DinterPro; IPR000184; Bac_surface_Ag; 1.
                                                                                                                                                                                                                                                                                                                                                                                                           DIDVKFNENKTEVDLTYKINEGSQYNISEMRIIGDTQKLDNELNQLLTHFKAGQLFRKTE
                                                                                                 LSIIEEQIKQILGDRGYGSAKV-DLYPKFNEEDHTVQINFIVDAGRRIYVRKIRFEGNDV
                                                                                                                                                                                         357 TADSTLRREMRQQEGAWLSTSAVSLAKSRLERTGFYETVEMSMPTVKNTDDQVDIIYKIK
                                                                                                                                                                                                                               EVKRHKLETGIRLDSEYGLGGKIAYDYYNLFNKGYIGSVVWDMDKYETTLAAGISQPR--
                                                                                                                                                                                                                                                                   -----AGITQDNFL
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                                                                                                                                                                                                                                                                                                                                                                                     RKIPGSDIDLG-----LHPENGHYLD
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     562 DRIQS--ADFDLSFGWNYNNLNRGYFPTAGSSANISGKLTLPGSDNKYYQVGTNFSGYIP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           -----FIIRGAGYTVARDNADVPSGLMFRSGGASSVRGYELDSI-----GL
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                                                                         ------GYPLAKLGNTRAAVNPDTATVDLNVVVDSGRPIAFGDFEITGTQR
                                                                                                                                                   235 YPEQIVSGLARFQPGTPYDLDLLLDFQQALEQNGHYSGASVQADFDRLQGDRVPVKVSVT
                                                                                                                                                                                                                                                                                                         ----NYRGNYWTSNVSYNRSTTQ---NLEKRAFSGGIWYVRDRAGIDARLGAEFLAEG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                 GKIGTTLGTFLSSTALIRTSARAGYFFT-------PENK--KLGT----
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01-DEC-2001 (TrEMBLrel. 19, Last sequence update)
01-DEC-2001 (TrEMBLrel. 19, Last sequence update)
01-MAR-2002 (TrEMBLrel. 20, Last annotation update)
Putative outer membrane transmembrane protein.
OMP OR R01502 OR SMC02094.
Rhizobium meliloti (Sinorhizobium meliloti).
Bacteria, Proteobacteria; alpha subdivision; Rhizobiaceae group;
Rhizobiaceae; Sinorhizobium.
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30;
                                          Ouery Match 6.0%; Score 189.5; DB 16; Length 776; Best Local Similarity 21.7%; Pred. No. 0.0013; Matches 130; Conservative 87; Mismatches 245; Indels 137; Gaps
                                                                                                                                                                                                                          122 YTVHIT--PGPRTKIANVGVAILGDILSDGNLAEYYRNALENWQQPVGSDFDQDSWENSK 179
                                                                                                                                                                                       237 EQIVSGLARFQPGTPYDLDLLLDFQQALEQNGHYSGASVQADFDRLQGDRVPVKVSVTEV 296
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                -----ILASV----TQEFAGLGGTSDFYKL----TGKAKWYYTLHDEADIIGSLSGSA 635
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 500 GLMFRSGG-----L 543
                                                                                                                          : |: ::| || : || : || 206 QSVIATKESGIFSFLTRKDVYNPDKLRADEELLRQFYYNRGYADFQVVSSEAALNEATNE 265
                                                                                                                                                                                                                                                                                                           297 KRHKLETGIRLDSEYGLGG ---- KIAYDYYNLFNKG-YIGSVVW --- DMDKYETT ---- 343
                                                                                                                                                                                                                                                                                                                                                                       492 FLGYRLAAGFDLFKN-ENDFDDDNYSYN------DQGFS-----LRVTAPITENLSTT 537
                                                                                                                                                                                                                                                                                                                                                                                                                                                                           399 FLAEGRKIP--GSDIDLGNSHATMLTAS-WKR------QLLNNVLHPENGHYLDGKI 446
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      447 GTTLGTFLSSTALIRTSARAGYFFTPENKKLGTFIIRGQA-GYTVARDNADV-----PS 499
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      80 EEVLDKEQTG---FLAEE---ADDNVKT---MLR----SKGY-----FSSKVSLTEKDGA 121
                                                                                                                                                                                                                                                                                                                                                                                                               ----LAAGISQPRNYRGNYWTSNVSYNRSTTQNLEKRAFSGGIWYVRDRAGIDARLGAE 398
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GenCore version 5.1.3 copyright (c) 1993 - 2002 Compugen Ltd.

OM protein - protein search, using sw model

November 9, 2002, 01:14:29 ; Search time 17 Seconds (without alignments) 1485.828 Million cell updates/sec Run on:

US-09-857-669-2 3173 1 MMIKPTALLDPALFFFPHAY.....IAYGHSDKKIRWHISLGTRF 609 Title: Perfect score: Sequence:

BLOSUM62 Gapop 10.0 , Gapext 0.5 Scoring table:

112892 segs, 41476328 residues Searched: Total number of hits satisfying chosen parameters:

Minimum DB seq length: 0 Maximum DB seq length: 2000000000

Post-processing: Minimum Match 0% Maximum Match 100% Listing first 45 summaries

SwissProt_40:* Database : Pred. No. is the number of results predicted by chance to have a score greater than or equal to the score of the result being printed, and is derived by analysis of the total score distribution.

	Description	20	P44038 haemophilus	P39170 escherichia	_		_	-	_	_	-		_	P47858 rattus norv	P47857 mus musculu	-	P14914 rickettsia		Q929g5 chlamydia p	Q25490 manduca sex	P23009 bean-pod mo	P16466 proteus mir	P42915 escherichia		Q53957 streptococc		_	P21647 klebsiella	Q03174 streptococc		P35077 bordetella	kph9	40	P13470 streptococc
SUMMARIES	QI		YTFM_HAEIN	UP05_ECOLI	D153_HAEIN	D152_HAEIN	D151_HAEIN	FASD_ECOLI	K6PF_HUMAN	K6PF_CANFA	K6PF_RABIT	YEBT_HAEIN	Y237_BUCAI	K6PF_RAT	K6PF_MOUSE	FPVA_PSEAE	120K_RICRI	OMPB_RICRI	PMP1_CHLPN	APLP_MANSE	VGNM_BPMV	HLYA_PROMI	YRAJ_ECOLI	VP1_BPCHP	TACY_STRCB	FIBP_ADEB3	YHJG_ECOLI	MRKC_KLEPN	FRUA_STRMU	TACY_STRPY	FHAC_BORPE	CARB_VIBCH	MYFC_YEREN	GTFC_STRMU
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æ	Ouery Mạtch	12	11.8	6.8		9.9	9.9	4.3	4.2	4.1	4.0	3.9	•	3.8	3.8	•	•	3.7	3.7			3.6		٠	•	•	•		•	•	3.4	3.4	3.4	3.4
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	Result No.		7	m	4	S	ø	7	ထ	6	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33

P38533 mus musculu	Q46113 campylobact	P16317 erwinia chr	P42790 pseudomonas	P47859 oryctolagus	P53517 escherichia	Q9uz16 pyrococcus	P09546 escherichia	Q9kka3 r outer mem	O35161 mus musculu	P06970 escherichia	Q46114 campylobact
HSF2_MOUSE	FLA3_CAMJE	PRTC_ERWCH	PICP_PSESR	K6PP_RABIT	AFAC_ECOL1	E2B1_PYRAB	PUTA_ECOLI	OMPB_RICCN	CLR1 MOUSE	FAED_ECOLI	FLB3_CAMJE
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                                                                                                                                                                                                                                                                                                                      74 LITQQQEEVLDKEQTGFLAEEAPDNVKTMLRSKGYFSSKVSL----TEKDGAYTV--HIT 127
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                                                                                                                                                                                                                                                                                Indels 111;
                                                                                                                                                                                                                                         Length 577;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Haemophilus influenzae.
Bacteria; Proteobacteria; gamma subdivision; Pasteurellaceae;
Haemophilus.
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                                                                                                                                                                             HYPOTHETICAL PROTEIN YTFM, 253D1D5BEA744D25 CRC64;
                                                                                                                                                                                                                                         DB 1;
                                                                                                                                                                                                                                                                              87; Mismatches 245;
                                                         EMBL; AP002568; BAB38621.1; -.
EcoGene; EG12513; YtfM.
InterPro; IRN00184; Bac_surfAg_D15.
Pfam; PF01103; Bac_surface_Ag; 1.
Hypothetical protein; Signal; Complete proteome.
                                                                                                                                                                                                                                     12.0%; Score 379.5; DB 24.7%; Pred. No. 3.3e-17
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01-NOV-1995 (Rel. 32, Last sequence update)
15-JUN-2002 (Rel. 41, Last annotation update)
                                                                                                                                                               POTENTIAL
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EMBL; U14003; AAA97116.1; -.
EMBL; AE000493; AAC77177.1; -.
EMBL; AE005654; AAG59418.1; -.
                                                                                                                                                                                                  64796 MW;
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STRAIN-Rd / KW20 / ATCC 51907;
                                                                                                                                                                                                                                                            Best Local Similarity 24.7% Matches 145; Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Protein HI0698 precursor.
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P44038;
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                                                                                                                                                             SIGNAL
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                                                                                                                                                                                                                                                                                                         Whole-genome random sequencing and assembly of Haemophilus influenzae
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                      Fleischmann R.D., Adams M.D., White O., Clayton R.A., Kirkness E.F., Kerlavage A.R., Bult C.J., Tomb J.-F., Dougherty B.A., Merrick J.M., McKenney K., Sutton G., Fitzhugh W., Fleids C.A., Gocayne J.D., Scott J.D., Shirley R., Liu L.-I., Glodek A., Kelley J.M., Weidman J.F., Phillips C.A., Sprigs T., Hedblom E., Cotton M.D., Utterback T.R., Hanna M.C., Nguyen D.T., Saudek D.M., Brandon R.C., Fine L.D., Fritchman J.L., Fuhrmann J.L., Geoghagen N.S.M., Gnehm C.L., McDonald L.A., Small K.V., Fraser C.M., Smith H.O.,
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PROTEIN H10698.
34F9AC189C505876 CRC64;
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Pfam; PF01.03; Bac_surface_Ag; 1.
Signal; Complete proteome.
SiGNAL
MEDLINE-95350630; PubMed-7542800;
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                                                                                                                                                                                                                                                                             Venter J.C.;
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SEQUENCE
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MEDLINE-21156231; PubMed=11258796;
MEDLINE-21156231; PubMed=11258796;
MEDLINE-21156231; PubMed=11258796;
Mayana K., Ishii T., Yokoyama K., Han C.-G., Ohtsubo E., Nakayama K., Murata T., Tanaka M., Tobe T.,
Iida T., Takami H., Honda T., Sasakawa C., Ogasawara N., Yasunaga T.,
Kuhara S., Shiba T., Hattori M., Shinagawa H.;
"Complete genome sequence of enterohemorrhagic Escherichia coli
0157:H7 and genomic comparison with a laboratory strain K-12.";
DNA Res. 8:11-22(2001).
                                                                                                                                                  416
                                           KRQLLNNVLHPENGHYLDGKIGTTLGTFLSSTALIRTSARAGYFFT-PENKKLGTFIIRG 484
                                                                                                                                  545 FTRTLSGAVFHDMGDAAANFKRMKLKHGSGLGVRWFSPLAPFSFDIAYGHSD----KKIR 600
                                                                                                                                                                                                                                                                                                                                                                                                                                                             SEQUENCE FROM N.A.
STRAIN=K12 / MG1655;
MEDLINE-97426617; PubMed-9278503;
Blattene F.R., Plunkett G. III, Bloch C.A., Perna N.T., Burland V.,
Riley M., Collado-Vides J., Glasner J.D., Rode C.K., Mayhew G.P.,
Gregor J., Davis N.W., Kirkpatrick H.A., Goeden M.A., Rose D.J.,
Mau B., Shao Y.;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Welch R.A., Blattner F.R.;
"Genome sequence of enterchaemorrhagic Escherichia coli O157:H7.";
Nature 409:529-533(2001).
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                                                                             QAGYTVARDNADVPSGLMFRSGGASSVRGYELDSIGLAGPNGSVLPERALLVGSLEYQLP
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         STRAIN-0157:H7 / EDL933 / ATCC 700927;
MEDLINE-21074935; PubMed-11206551;
Perna N.T., Plunkett G. III, Burland V., Mau B., Glasner J.D.,
Rose D.J., Mayhew G.F., Evans P.S., Gregor J., Kirkpatrick H.A.,
Posfai G., Hackett J., Klink S., Boutin A., Shao Y., Miller L.,
Grotbeck E.J., Davis N.W., Lim A., Dimalanta E.T., Potamousis K.,
Apodaca J., Anantheraman T.S., Lin J., Yen G., Schwartz D.C.,
                                                                                                                                                                                                                                                                                                                                                                                                          Bacteria; Proteobacteria; gamma subdivision; Enterobacteriaceae;
Escherichia.
                                                                                                                                                                                                                                                                                  UP05_ECOLI STANDARD; PRT; 810 AA.
P39170; P39181; P77465;
01-FEB-1995 (Rel. 31, Created)
01-NOV-1997 (Rel. 35, Last sequence update)
16-OCT-2001 (Rel. 40, Last annotation update)
Unknown protein from 2D-page spots M62/M63/03/09/T35 precursor.
YAET OF B0177 OR 20188 OR ECS0179.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           "The complete genome sequence of Escherichia coli K-12."; Science 277:1453-1474(1997).
QADITDKTLLLYPTVGFTRTRLRGGSFATWG-----DVQKI----TFDLS--
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Submitted (SEP-1996) to the EMBL/GenBank/DDBJ databases
                                                                                                                                                                                                                                                                                                                                                                                 Escherichia coli, and Escherichia coli 0157:H7
                                                                                                                                                                                                                                                                                                                                                                                                                                     NCBI_TaxID=562, 83334;
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570 FYIGLGT 576
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 AT---MLTASWKRQLLNNVLHPENGH--YLDGKI------GTTLGTFLSSTALIRT 462
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                DNVKTMLRSKGYF----SSKVSLT-EKDGAY-TVHITPGPRTKIANVGVAILGDILSDG 149
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  NLAEYYRNALENWQQPVGSDFDQDSWENSKTSVLGAVTRKGYPLAKLGNTRAAVNPDTAT 209
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                                                                                                                              Link A.J., Robison K., Church G.M.;
"Comparing the predicted and observed properties of proteins encoded in the genome of Escherichia coli K-12.";
Electrophoresis 18:1259-1313(1997).
-: SUBCELJULAR LOCATION: Outer membrane (Potential).
-: SIMILARITY: BELONGS TO THE SURFACE ANTIGEN D15 FAMILY.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Gaps
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            90552 MW; DDCE4C6D341664EB CRC64;
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EMBL, BC05193; AAG54479.1; -...
EMBL, AP002550; BAB33602.1; -...
SMISS-2DPAGE; P39170; COLI.
ECCGENE; EG12676; yaeT.
InterPro; IPR000184; Bac_surfaq_D15.
Pfam; PF01103; Bac_surface_Ag; 1.
Outer membrane; Signal; Complete proteome.
                                                                  STRAIN=K12 / EMG2;
MEDLINE=97443975; PubMed=9298646;
[5]
SEQUENCE OF 21-32 AND 351-362.
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                                                                                                                                                                                                                                                                                                                                                  Infect. Immun. 65:3701-3707(1997).
-1- SUBGELLULAR LOCATION: Outer membrane.
-1- SIMILARITY: BELONGS TO THE SURFACE ANTIGEN D15 FAMILY.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            24;
                       786
                                                                                                                                                                                                                                                                                                                     "Outer membrane protein D15 is conserved among Haemophilus influenzae species and may represent a universal protective antigen against
                                                                                                                                                                                                                                                                         STRAIN=PAK 12085;
MEDLINE-97427952; Pubmed-9284140;
Loosmore S.M., Yang Y.P., Coleman D.C., Shortreed J.M., England D.M.,
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                -TATVDLNVVVDSGRPIAFGDFEITGTQRYPEQIVSGLARFQPGTPYDLDLLLDFQQALE 265
              --- LKHGSGLGVRWFSPLAPFSFD
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            150 NLAEYYRNALENWQQPVGSDFDQDSWENSKTSVLGAVTRKGYPLAKLGNTRAAVNPD---
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         85; Mismatches 254; Indels 139;
                                                                                                                                            16-00T-2001 (Rel. 40, Created)
16-0CT-2001 (Rel. 40, Last sequence update)
16-0CT-2001 (Rel. 40, Last annotation update)
Protective surface antigen D15 precursor (80 kDa D15 antigen)
                                                                                                                                                                                                      Haemophílus influenzae.
Bacteria: Proteobacteria: gamma subdivision; Pasteurellaceae;
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21.0%; Pred. No. 2.7e-06;
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Pfam; PF01103; Bac_surface_Ag; 1.
Antigen; Outer membrane; Signal.
-- FTRTLSGAVFHDMGDA-AANFKRMK-
                                                         87511 MW;
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                                           IAYG----HSDKKIRWHISLG
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                                                                                                                                                                                                                                                                                                                                            invasive disease.
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                                                                                                                        D153_HAEIN
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446 FLGTGAAVSIAGTKNDYGTSVNLGYTEPYFTKDGVSLGGNIFFENYDNSKSDTSSNYKRT 505
                                                                                                                                                                                                                                                                                                                                                                                                                                        573 TFNKISSDVIGGNAITTASAELIVPTPFVSDKSONTVRTSLFVDAASVWNTKWKSDKNGL 732
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MEDLINE=95350630; PubMed=7542800;

Fleistchman R.D., Addam M.D., White O., Clayton R.A., Kirkness E.F.,

Rerlavage A.R., Bult C.J., Tomb J.-F., Dougherty B.A., Merrick J.M.,

McKenney K., Sutton G., Fitzhugh W., Fleids C.A., Gocayne J.D.,

Scott J.D., Shirley R., Liu L. I., Glodek A., Kelley J.M.,

Weidman J.F., Phillips C.A., Spriggs T., Hedblom E., Cotton M.D.,

Utterback T.R., Hanna M.C., Nguyen D.T., Saudek D.M., Brandon R.C.,

Fine L.D., Fritchman J.L., Fuhrmann J.L., Geoghagen N.S.M.,

Gnehm C.L., McDonald L.A., Small K.V., Fraser C.M., Smith H.O.,
                                                                             -GRKIPGSDIDLG
                                                                                                                                                  506 TYGSNVTLGFPVNENNSYYVGLGHTYNKISNFALEYNRNLYIQSMKFKGNGIKTNDFD..
                                                                                                                                                                                                                                    415 NSHATMLTASWKRQLLNNVLHPENGHYLDGKIGTTLGTFLSSTALIRTSARAGYFFTPEN
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15-JUN-2002 (Rel. 41, Last annotation update)
Protective surface antigen DIS precursor (80 kDa DIS antigen)
(D-15-Ag) (Outer membrane protein DIS).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Haemophilus influenzae.
Bacteria; Proteobacteria; gamma subdivision; Pasteurellaceae;
Haemophilus.
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-!- SUBCELLULAR LOCATION: Outer membrane.
-!- SIMILARITY: BELONGS TO THE SURFACE ANTIGEN D15 FAMILY.
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Pfam; PF01103; Bac_surface_Ag; 1.
Antigen; Outer membrane; Signal; Complete proteome.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    795 AA
                                                                         377 AFSGGI---WYVRDRAGIDARLG----AEFLAE---
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    PRT;
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    STANDARD;
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789 IGGSF 793
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Venter J.C.;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     HI0917
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P44935;
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RL Gene 156:97-99(1995).  RN [2] RN [2] RN [2] RX SEQUENCE FROM N.A.:  RA LOSSMORE AS LOUGH B.;  RA LOSSMORE S.M., Yang Y.P., Coleman D.C., Shortreed J.M., England D.M.,  RA LOSSMORE AND TEPPESSOR I UNIVERSAL PROTECTIVE antigen against represent a universal protective antigen against rovasive disease.";  RT FOUTER MAIN.  RY Species and may represent a universal protective antigen against rovasive disease.";  RT Infect Immun. 65:3701-3707(1997).  CC	SEQUENCE 197 AA; 8705 MW; ZF93DED3809DAFIB  Duery Match  8.64; Score 209.5; DB 1;  Best Local Similarity 20.04; Pred; No. 4.9e-06;  Aatches 130; Conservative 103; Mismatches 280;  61 DSEIKDMVEEHLPITQOQEEVLDKEOGTGFLAEEAPDNVKTMI;  11 :
FT SIGNAL  1 19 PROTEKTIAL.  SQ SEQUENCE 795 AA: 87478 MW; B85691FC22E6ED44 CRC64;  OUGLY MATCH  6.64; SCORE 209.5; DB 1; Length 795;  Best Local Similarity 20.08; Pred. No. 4.8e-06;  MAtches 130; Conservative 103; Mismatches 277; Indels 141; Gaps 24;  61 DSEIXDMVEEHLPLITOODEVLUXEOTGFLAEEAPDNVYTMLRSKGYFSKVSLT 116  11	390 GIDARIGAEFLEGRKIPGSDIDGNSHATMITASWKRQLL  522 SYYVGLGHTYNKISNFALEYNRNLYIOSMKFKGNCIKTNDFDFSFGWNYNSL  522 SYYVGLGHTYNKISNFALEYNRNLYIOSMKFKGNCIKTNDFDFSFGWNYNSL  431 NNVLHPENGHYLDGKIGTTLGTFLSSTALIRTSARAGYFFTPENKKLGTFIIRGOAGTYV  574 NRGYFFTGG-VKASLGGRYTPGSDNKYKLSADVOGFYPLDRDHLWVSARASAGYAN  491 ARDNADVPSGIMFRSGGASSYRGTELDSIGLAGRN

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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           22;
336 IQ-----PFSTLPEMKREGV------SGYEISLGHYNNS 363
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       RIDTQDSEIKDMVEEHLPLITQQQEEVLDKEQTGFLAEEAPDNVKTMLRSKGYFSSKVSL 115
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     TEKDGAYTV---HITPGPRTKIANVGVAILGDILSDGNLAEYYRNALENWQQPVGSD--F 170
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 GTQRYPEQIVSGLARFQPGTPYDLDLLLDFQQALEQN------GHYSGASVQADFD 280
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      259 KIYSNDEMLNDRLRSYTPTV-------RGIASSQAVV 288
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             GATOYYNESPFLYASWSRGYRNGMTLYSETIQSRKYQLLGVGSTLSLGDFGAVSGDASLS 423
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Outer membrane.
                                                                                                                                                                                                                                                                                                                                                                                                             "Permissive linker insertion sites in the outer membrane protein of 987P fimbriae of Escherichia coll.";
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 289 TIKQGGVVILQKNVPPGPFE-----INDFSLSGYSGDLYVNIKEADGSEHSF
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  DQDSWENSKTSVLGAVTRKGYPLAKLGNTRAAVNPDTATVDLNVVVDSGRPIAFGDFEIT
                                                                                                                                                                                                                                                                                  Bacteria; Proteobacteria; gamma subdivision; Enterobacteriaceae;
Escherichia.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         InterPro; IPRO00015; Fimb_usher.
Pfam: PF00577; Usher: 1.
PROSITE; PS01151; FIMBRIAL_USHER; 1.
Outer membrane; Transmembrane; Fimbria; Transport; Signal.
SIGNAL 1 21 POTENTIAL.
CHAIN 22 835 OUTER MEMBRANE USHER PROTEIN FASD.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        4.3%; Score 138; DB 1; Length 835;
17.8%; Pred. No. 0.21;
ive 87; Mismatches 201; Indels 192;
                                                                                                                                                                                                                                                                                                                                                                                                                                        KSSRIRASTGVGFQWQSPIGPLVFSYAKPIKKYENDDVE-QFQFSIGGSF 797
                                              ---KLKHGSGLGVRWFSPLAPFSFDIA----YGHSDKKIRWHISLGTRF
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         2FECE6E2305274E1 CRC64;
                                                                                                                                                                                    01-NoV-1995 (Rel. 32, Created)
01-NoV-1995 (Rel. 32, Last sequence update)
01-NOV-1997 (Rel. 35, Last annotation update)
Outer membrane usher protein fasD precursor.
                                                                                                                                                        835 AA
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                                                                                                                                                        STANDARD;
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                                                                                                                                                                                                                                                                     Escherichia coli
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KGPF_HUMAN STANDARD; PRT; 779 AA.
P08237; Q16814; Q16815;
01-AUG-1988 (Rel. 08, Last sequence update)
01-AUG-1988 (Rel. 09, Last annotation update)
16-OCT-2001 (Rel. 40, Last annotation update)
6-phosphofructokinase
1 (Phosphohexokinase) (Phosphofructo-1-kinase isozyme A) (PFK-A).
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MEDLINE-89306075; PubMed-2526045;
Sharma P.M., Reddy G.R., Vora S., Babior B.M., McLachlan A.;
"Cloning and expression of a human muscle phosphofructokinase cDNA.";
Gene 77:177-183(1989).
                              RANKYDKIHSGOSYGLKYS----KNKVDTGTTVTLATYRYSTKDFYSFNDFVSKNDSVQ 478
                                                                                                                                    383 WYVRDRAGIDARLGAEFLAEGRKIPG--SDIDL----GNSHATMLTASWKRQLLNNVLHP 436
                                                                                                                                                                                                      ENGHYLDGKIGTTLGTFLSSTALIRTSARAGYFFTPENKKLGT----FIIRGQAGYTVAR 492
RL-----QGDRVPVKVSVTEVKRHKLETGIRLD-SEYGLGGKIAYDYYNLFNKGYIGS 332
                                                                                                                                                                                                                                        591 RNTATLAGKVPGSMAQYRFSSGWANTEQSS-----NKALSVNWDGDLLDGSLGYTSSG 643
                                                                                                                                                                                                                                                                                                          644 KNRITDYSLSGSAILYPWRLAIGSDSVINGAAVVETEFISGIKVROGGETSLLGTAIVTS 703
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Yamasaki T., Nakajima H., Kono N., Hotta K., Yamada K., Imai E., Kuwajima M., Noguchi T., Tanaka T., Tarui S.; "Structure of the entire human muscle phosphofructokinase-encoding
                                                                  33 VVWDMDKYETTLAAGISQPRNYRG-----NYWTSN-VSYNRSTTQNLEKRAFSGGI
                                                                                     -----ADVPSGLMFRSGGASSVRGYEL---
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            MEDLINE-90264379; PubMed-2140567;
Sharma P.M., Reddy G.R., Babior B.M., McLachlan A.;
"Alternative splicing of the transcript encoding the human muscle
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Euteleostomí;
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Butele
Mammalia; Eutheria; Primates; Catarrhini; Hominidae; Homo.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Strausberg R.; Submitted (NOV-2000) to the EMBL/GenBank/DDBJ databases.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Tanaka
                                                                                                                                                                                                                                                                                                                                              543
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MEDLINE-88030023; PubMed-2822475;
Nakajima H., Noguchi T., Yamasaki T., Kono N., Tanaka
Nakajima H., Noguchi T., Yamasaki T., Kono N., Tanaka
"Cloning of human muscle phosphofructokinase cDNA.";
FEBS Lett. 223:113-116(1987).
                                                                                                                                                                                                                                                                                                                                              -----DSIGLAGPNGSVLPERALLVGSLEYQL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              SEQUENCE OF 271-680 FROM N.A. (ISOFORM 2).
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               gene: a two-promoter system.";
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Sene 104:277-282(1991).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Homo sapiens (Human)
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NO
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281
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M59736; AAA82938.1; JOINED.
M59738; AAA82938.1; JOINED.
M59739; AAA82938.1; JOINED.
M59739; AAA82938.1; JOINED.
M50766; AAA6068.1; --Y00698; CAA68692.1; --R00693; AAA60531; AAA79220.1; --M24925; AAA79220.1; --M24925; AAA36436.1; ---

AAAB2938.1;

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Interpro; IPR000023; Ppfruckinase.
Pfam: PF00365; PFK; 2.
PRINTS; PR00476; PHFRCTKINASE.
Probom; PD000707; Ppfruckinase; 2.
PROSTIE: PS00433; PHOSPHOFRUCTOKINASE; 2.
Kinase; Transferase; Glycolysis; Repeat; Allosteric enzyme;
Phosphorylation; Magnesium; Multigene family; Alternative splicing;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Disease mutation; Glycogen storage disease
                                                                                                                                                                                                                                           PIR; PH0223, PH0223.
PIR; S00158, S00158.
PIR; JS0205, JS0205.
HSSP, P00512, 3PFK.
HSC-2DPAGE, P08337; HUMAN.
Genew, HGNC:8877; PFKM.
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MOD_RES
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      fructose 1,6-bisphosphate.
-!- COFACTOR: MAGNESIUM.
-!- ENZYME REGULATION: ALLOSTERIC ENZYME ACTIVATED BY ADP, AMP, OR
-!- ENZYME REGULATION: ALLOSTERIC ENZYME ACTIVATED BY ATP OR CITRATE.
-!- PATHWAY: KEY CONTROL STEP OF GLYCOLYSIS.
-!- SUBUNIT: TETRAMER. MUSCLE IS M4, LIVER IS L4, AND RED CELL IS M3L,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      MILE, OR MLI.

ALTERNATIVE PRODUCTS: 2 isoforms; 1 (shown here) and 2; are produced by alternative splicing.

DISEASE: DEPECTS IN PERM ARE THE CAUSE OF GLYCOGEN STORAGE DISEASE INTERCALS OF WITH ASSOCIATED NAUSEA ND VOMITING. SHORT BURSTS OF INTRONE ACTIVITY ARE PARTICULARLY DIFFICULT. SEVERE MUSCLE CRAMES AND WYGOLOBINNRIA DEVELOP AFTER VIGOROUS EXERCISE. MOST PATIENTS OBTAIN A "SECOND WIND" WHEN THE PATIENTS OF EXERCISE. IN STAINTY LEVEL AND ARGORDING IN TIME PATIENTS ADJUGT THEIR ACTIVITY LEVEL AND ARE WELL COMPENSATED.

MISCELLANEOUS: IN HUMAN PFK EXISTS AS A SYSTEM OF 3 TYPES OF
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               ISOENZYMES. SIMILARITY: BELONGS TO THE PHOSPHOFRUCTOKINASE FAMILY. TWO DOMAIN
                                                                                                                                                                                                                                                                                                                                                                                                                                                           Functional expression of human mutant phosphofructokinase in yeast: genetic defects in French Canadian and Swiss patients with phosphofructokinase deficiency.";
Amb. J. Hum. Genet. 56:131-141(1995).
                                                                                                      MEDLINE-89306652; PubMed-2526044;
Valdez B.C., Chen Z., Sosa M.G., Younathan E.S., Chang S.H.;
"Human 6-phosphofructo-1-kinase gene has an additional intron upstream of start codon.";
Gene 76:167-169(1989).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           SUBUNITS, PFKM (MUSCLE), PFKL (LIVER) AND PFKP (PLATELET)
                                                                                                                                                                                                                                                                                                                                                                         VARIANTS GSD-VII GLN-99; ASP-208 AND HIS-695.
BEDLINE-95126102; PubMed-7825568;
Raben N., Exelbert R., Splegel R., Sherman J.B., Plotz P.,
Heinisch J.;
                                                                                                                                                                                                                                                                                                           "Mutations in muscle phosphofructokinase gene.";
Hum. Mutat. 6:1-6(1995).
isoenzyme of phosphofructokinase.";
                    Biol. Chem. 265:9006-9010(1990).
                                                                                                                                                                                                                                         REVIEW ON GSD-VII VARIANTS.
MEDLINE-96055509; PubMed-7550225;
Raben N., Sherman J.B.;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      1; JOINED.
1; JOINED.
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EMBL; M59720; AAA82938.1; JO
EMBL; M59721; AAA82938.1; JO
                                                           SEQUENCE OF 1-27 FROM N.A.
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                                                                                         rissue-Muscle;
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SIMILARITY)

PHOSPHORYLATION (BY

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335
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                141 ILGDILSDGNLAEYYRNALENWQQPVGSDFDQDSWENSKTSVL----GAVTRKGYPLAKL 196
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          287
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             334 VVSLSGNQAVRLPLMECVQVTKDVTKAMDEKKFDEALKLRGR-SFMNNWEVYKLLAHVRP 392
                                                                                                                                                                                                                                                                                                                                                         71; Mismatches 241; Indels 196; Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      GNTRAAVNP---DTATVDLNVVVDSGRPIAFGDFEITGTQRYPEQIVSGLARFQPGTP-- 251
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      336 DMDKYETTLAAGISQPRNYRGNYWTSNVSYNRSTTQNLEKRAFS------GGIWY 384
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       ------SYVGG-WTGQGGSKLGTKRTLPKKSFEQISANITKFNIQGLVI 494
              MISSING (IN ISOPORM 2).

R -> L (IN GSD-VII; ASHKENAZI).

FTIG-VAR_006063.

R -> P (IN GSD-VII; ITALIAN).

FTIG-VAR_006064.

R -> Q (IN GSD-VII; SWISS).

FTIG-VAR_006065.

G -> D (IN GSD-VII; FRENCH CANADIAN).

FTIG-VAR_006066.

D -> A (IN GSD-VII; ITALIAN).

FTIG-VAR_006067.

M -> C (IN GSD-VII; ITALIAN).
                                                                                                                                                                                                                                                                                                                                                                                                                DIKNLVVKRLGYDTRVTVLGHVQRGGTPSAFD -- RILGS - RMGVEAVMALLEGTPDTPAC
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            -----YDLDLLLD---FQQALEQNGHYSGASVQADFDRLQGDRV
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                PVK-----VSVTEV--KRHKLETGIRLDSEYGL--GGK--IAYDYYNLFNKGYIGSVVW
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   393 PVSKSGSHTVAVMNVGAPAAGMNAAVRSTVRIGLIQGNRVLVVHDGFEGLAKGQIEEAGW
                                                                                                                                                                                                                                                                                                                      / Match 4.2%; Score 133; DB 1; Length 779; Local Similarity 20.6%; Pred. No. 0.41;
                                                                                                                                                                                                                   /FTId=VAR_006068.
/FTId=VAR_006068.
/FTId=VAR_006069.
                                                                                                                                                                                                                                                                                     4C9F384A7A5A5750 CRC64;
                                                                                                                                                                                                                                                                                   779 AA; 85051 MW;
                                                                                                                                                                                                                                                                                                                                                           Matches 132; Conservative
774
311
38
                                                                                                                                                                                                                                                  695
                                                                                                                                           208
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                    281
38
                                                                                                                                                                              542
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                                                                                                                                           208
                                                                                                                                                                                                                                                                                     SEQUENCE
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                                  VARIANT
                                                                       VARIANT
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M59722; AAA82938.1; JOINED.
M59723; AAA82938.1; JOINED.
M59724; AAA82938.1; JOINED.
M59725; AAA82938.1; JOINED.
M59726; AAA82938.1; JOINED.
M59727; AAA82938.1; JOINED.
M59729; AAA82938.1; JOINED.
M59729; AAA82938.1; JOINED.
M59729; AAA82938.1; JOINED.

EMBL; EMBL; EMBL; EMBL; EMBL; EMBL;

EMBL;

EMBL;

JOINED. JOINED.

AAA82938.1 AAA82938.1

AAA82938.1; AAA82938.1;

M59734; M59732;

EMBL; EMBL; EMBL; EMBL;

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REPEAT
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                                                                                                                                                                                                                                                                                                                                                         195
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FT
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           01-OCT-1996 (Rel. 34, Created)
01-OCT-1996 (Rel. 34, Last sequence update)
16-OCT-2001 (Rel. 40, Last annotation update)
6-phosphofructokinase, muscle type (EC 2.7.1.11) (Phosphofructokinase)
1) (Phosphohexokinase) (Phosphofructo-1-kinase isozyme A) (PFK-A).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          -1- ENZYME REGULATION: ALLOSTERIC ENZYME ACTIVATED BY ADP, AMP, OR FRUCTYOE BISPHOSPHATE AND INHIBITED BY ATP OR CITRATE.
-1- PATHWAY: KEY CONTROL STEP OF GLYCOLYSIS.
-1- SUBUNIT: HOMOTETRAMER (BY SIMILARITY).
-1- SIMILARITY: BELONGS TO THE PHOSPHOFRUCTOKINASE FAMILY: TWO DOMAIN
                    422
                                                                551
                                                                                                          471
                                                                                                                                                   596
                                                                                                                                                                                                                                                                                                                : | ::| :: | | | 649 GIFDSRKNVLGHMQQGGSPTPFDRNFA---TKMGAKAMNWMSGKIKESYRNGRIFANTP 704
                                                                                                                                                 552 CDRIKQSAAGTKRRVF-------IIETMGGYCGYLATMAGLAAGADAAYIFE
                                              ---IPGSDIDLGNSHA--TMLT-
                                                                                                                                                                                               PENKKLGTFIIR---GQAGYTVARDNADVPSGLMFRSGGASSVRGYELDSI-GLAGPNG-
                                                                                                                                                                                                                                        E----PFTIRDLOANVEHLVQKMKTTVKRGLVLRNEKCN--ENYTTDFIFNLYSEEGK
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Smith B.F., Henthorn P.S., Rajpurohit Y., Stedman H., Wolfe J.H.,
Patterson D.F., Giger U.;
A cDNA encoding canine muscle-type phosphofructokinase.";
Gene 168:275-276(1996)
-!- CATALYTIC ACTIVITY: ATP + D-fructose 6-phosphate - ADP + D-fructose 1,6-bisphosphate.
                                                                                                                                                                                                                                                                                      SVLPERALLVGSLEY --- QLPFTRTLSGAVFHDMGDAAANFKRMKLKH------
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Euteleostomi;
Mammalia; Eutheria; Carnivora; Fissipedia; Canidae; Canis
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Processing 
                                                                                                                                                                                                                                                                                                                                                                                                     --GSGLGVR----WFSPLAPFSFDIAYGHSDKKIRWHISL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    781 AA,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      SEQUENCE FROM N.A.
TISSUE-Skeletal muscle;
MEDLINE-96194913; Pubmed-8654960;
                    VRDRAGIDARLGAEFLAEGRK -----
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 EMBL; U25183; AAC48615.1; -. HSSP; P00512; 3PFK.
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          -1- COFACTOR: MAGNESIUM
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Canis familiaris (Dog)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            NCBI_TaxID=9615;
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01-CCT-1989 (Rel. 12, Last sequence update)
16-CCT-2001 (Rel. 40, Last annotation update)
6-phosphofructokinase, muscle type (EC 2.7.1.11) (Phosphofructokinase)
1) (Phosphohexokinase) (Phosphofructo-1-kinase isozyme A) (PFK-A).
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   447 GQIEEAGW-----SYVGG-WTGQGGSKLGTKRTLPKKSFEQISANITK 488
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          463
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                                                                                                                                                                                                                                          EVLDKEQTGFLAEEAPDNVKTMLRSKGYFSSKVSLTEKDGAYTVHITPGPRTK1ANVGVA 140
                                                                                                                                                                           Gaps
                                                                                                                                                                                                                                                                                                                                                                        141 ILGDILSDGNLAEYYRNALENWQQPVGSDFDQDSWENSKTSVL----GAVTRKGYPLA--
                                                                                                                                                                                                                                                                                                                                                                                                                         327 TPDTPACVVSLSGNQAVRLPLMECVQVTKDVTKAMNDRKFDEAMKLRGRSFMNNMEVYKL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           643 NLYSEEGKGIFDSRKNVLGHMQQGGSPTPFDRNFA----TKMGAKAMNWMSGKIKESYRN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             -----KLGNTRAAVNPDTATVDLNVVVDSGRPIAFGDFEITGTQRYPEQIVSGLARF
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     387 LAHIRPPVSKTSATMHTVAVMNVGAPAAGMNAAVRSTVRIGLIQGNRVLVVHDGFEGLAK
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         ---GGIWYVRDRAGIDARLGAEFLAEGRK-------IPGSDIDLGNSH
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     489 FNIOGLIII----GGFEAYTGGLELMEGRKOFDELCIPFVVIPATVSNNVPGSDFSVGADT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          A--TMLT------ASWKRQLLNNVLHPENGHYLDGKIGTTLG---TFLSSTALIRTS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        464 ARACYFFTPENKKLGTFIIR---GQAGYTVARDNADVPSGLMFRSGGASSVRGYELDSI-
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       591 ADAAYIPEE-----PFTIRDLQANVEHLVQKMKTTVKRGLVLRNEKCN--ENYTTDFIF
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          520 GLAGPNG-SVLPERALLVGSLEY---QLPFTRTLSGAVFHDMGDAAANFKRMKLKH----
                                                                                                                                                                                                                                                                                                     186 EIVDAITTTAQSHQRTFVLEVMGRHCGYLALVTSLS-.CGADWVFIPECPPD-...-
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           277 EIKELVVKRLGY-----DTRVTVLGHVORGGTPSAFD--RILGS-RMGVEAVMALLEG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          QPGTPYDLDLL-----LDFQQALEQNGHYSGASVQADFD---RLQG------
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   285 -DRVPVKVSVTEVKRHK------LETGIRLDSEYGL--GGK--IAYDYYNLFNK
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    GYIGSVVWDMDKYETTLAAGISQPRNYRGNYWTSNVSYNRSTTQNLEKRAFS-----
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         546 ALNTICTTCDRIKQSAAGTKRRVF------IIETMGGYCGYLATMAGLAAG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Oryccolagus cuniculus (Rabbit).
Eukaryota, Metazoa, Chordata, Craniata, Vertebrata; Euteleostomi;
Mammalia, Eutheria, Lagomorpha, Leporidae, Oryctolagus.
                                                                                                 4.1%; Score 131; DB 1; Length 781;
19.9%; Pred. No. 0.55;
7ative 73; Mismatches 236; Indels 210;
PHOSPHORYLATION (BY SIMILARITY)
15CA0B45438462EE CRC64;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  572 ------GSGLGVR----WFSPLAPFSFDIAYGHSDKKIRWHISL 605
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MEDLINE=87166033; PubMed=2951385;
                                  85429 MW;
                                                                                                                                                                       Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     STANDARD;
                                  781 AA;
                                                                                                                                        Similarity
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P00511;
                                                                                                                                                                       Matches 129;
MOD_RES
SEQUENCE
                                                                                                 Query Match
                                                                                                                                           Local
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"Whole-genome random sequencing and assembly of Haemophilus influenzae
                                                                                                                                                                                                                                                                                                                                                81 EVLDKEQTGFLAEEAPDNVKTMLRSKGYFSSKVSLTEKDGAYTVHITPGPRTKIANVGVA 140
                                                                 141 ILGDILSDGNLAEYYRNALENWQQPVGSDFDQDSWENSKTSVL----GAVTRKGYPLAKL 196
                                                                                                                              197 GNTRAAVNP---DTATVDLNVVVDSGRPIAFGDFEITGTQRYPEQIVSGLARFQPGTPYD 253
                                                                                                                                                                                              254 LDLL-----LDFQQALEQNGHYSCASVQADFD---RLQGDRVPVKVSVTEVKRH---- 299
                                                                                                                                                                                                                            334 VVSLSGNQAVRLPLMECVQVTKDVTKAMDEKRFDEAMKLRGRSFMNNWEVYKLLAHIRPP 393
                                                                                                                                                                                                                                                                                          394 APKSGSYTVAVMNVGAPAAGMNAAVRSTVRIGLIQGNRVLVVHDGFEGPAKGQIEEAGW- 452
                                                                                                                                                                                                                                                                                                                                                                                                                         496 ---GGFEAYTGGLELMEGRKOFDELCIPFVVIPATVSNNVPGSDFSVGADTALNTICTTC 552
                                                                                                                                                                                                                                                                                                                                                                                                                                                          -----ASWKRQLLNNVLHPENGHYLDGKIGTTLG---TFLSSTALIRTSARAGYFFTP 472
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        DRIKQSAAGTKRVF-------IIETMGGYCGYLATMAGLAAGADAAYIFEE 597
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             SEQUENCE FROM N.A.
STRAIN-RA (*WA2O / ArCC 51907;
MEDLINE-95150630; PubMed-7542800;
MEDLINE-95150630; PubMed-7542800;
MEDLINE-95150630; PubMed-7542800;
MELSCHMENN R.D., Adams M.D., White O., Clayton R.A., Kirkness E.F., Kerlavage A.R., Bult C.J., Tomb J.-F., Dougherty B.A., Merrick J.M., McRanney K., Sutton G., Fitzhugh W., Fields C.A., Geozyne J.D., Scott J.D., Shirley R., Liu L.-I., Glodek A., Kelley J.M., Weidman J.F., Phillips C.A., Spriggs T., Hedblom E., Cotton M.D., Utterbock T.R., Hannam M.C., Nguyen D.T., Sauddek D.M., Brandon R.C., Fine L.D., Fritchman J.L., Fuhrmann J.L., Geoghagen N.S.M., Gnehm C.L., McDonald L.A., Small K.V., Fraser C.M., Smith H.O.,
                                                                                     ---KLETGIRLDSEYGL--GGK--IAYDYYNLFNKGYIGSVVWD
                                                                                                                                                                                                                                                                                                                          337 MDKYETTLAAGISQPRNYRGNYWTSNVSYNRSTTQNLEKRAFS------GGIWYV
                                                                                                                                                                                                                                                                                                                                                                                          386 RDRAGIDARLGAEFLAEGRK-----TMLT--
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          473 ENKKLGTFIIR---GQAGYTVARDNADVPSGLMFRSGGASSVRGYELDSI-GLAGPNG-S
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        -----PFTIRDLOANVEHLVOKMKTTVKRGLVLRNEKCN--ENYTTDFIFNLYSEEGKG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        528 VLPERALLVGSLEY---QLPFTRTLSGAVFHDMGDAAANFKRMKLKH-------
                                 186 EIVDAITTTAQSHQRTFVLEVMGRHCGYLALVTSLS--CGADWVFIPECPPD-----
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Haemophilus.
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01-NOV-1995 (Rel. 32, Last sequence update)
15-JUN-2002 (Rel. 41, Last annotation update)
Protein HI1672.
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P44288;
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                                                                                                                                                                                                                                         -1- SUBUNIT: HOMOTETRAMER.
-1- SIMILARITY: BELONGS TO THE PHOSPHOFRUCTOKINASE FAMILY. TWO DOMAIN
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           4.0%; Score 128; DB 1; Length 779;
20.0%; Pred. No. 0.86;
Live 72; Mismatches 245; Indels 194; Gaps
                                                          MEDLINE-64219739; PubMed-6233492;
Poorman R.A., Randolph A., Kemp R.G., Heinrikson R.L.;
"Evolution of phosphofructokinase -- gene duplication and creation
                                                                                                                          Nature 309:467-469(1984).
-!- CATALTYIC ACTIVITY: ATP + D-fructose 6-phosphate = ADP + D-fructose 1,6-b1sphosphate.
-!- COFACTOR: MAGNESIUM.
-!- ENZYME REGULATION: ALLOSTERIC ENZYME ACTIVATED BY ADP, AMP, OR FRUCTOSE BISPHOSPHATE AND INHIBITED BY ATP OR CITRATE.
-!- PATHMAY: KEY CONTROL STEP OF GLYCOLYSIS.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Allosteric enzyme;
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96D8E7C7B5D3C8A9 CRC64;
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PHOSPHORYLATION.
R -> S (IN REF. 2).
MISSING (IN REF. 2).
S -> I (IN REF. 2).
MISSING (IN REF. 2).
 structure, function, and tissue specificity."; J. Biol. Chem. 262:4195-4199(1987).
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PRODOM; PD00070; Ppfruckinase; 2.
KNOSTTE, PS00433; PHOSPHOFRUCTOKINASE; 2.
Kinase; Transferase; Glycolysis; Repeat; Allo
Phosphorylation; Magnesium; Multigene family.
REPEAT 1 401 APPROXIMATE.
                                                                                                                                                                                                                                                                                                                                                                                                                                                   AAA31441.1; JOINED.
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Pfam; PF00365; PFK; 2.
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M14472; AAA31441.1; JOINED.
M14473; AAA31441.1; JOINED.
M14474; AAA31441.1; JOINED.
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PIR; A26550; A26550.
HSSP; P00512; 3PFK.
                                                                                                               new effector sites.
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Matches 128; Conserv
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565
779 I
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M14461;
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                                                                                                                                              Langen H., Takacs B., Evers S., Berndt P., Lahm H.W., Wipf B., Gray C., Fourtoulakis M.;
Two-dimensional map of the proteome of Haemophilus influenzae.";
Electrophoresis 21:411-429(2000).
-1- SIMILARITY: BELONGS TO THE PQIB FAMILY. STRONG, TO E.COLI YEBT.
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771 YRGVEVGTVKKFELNSLGDRVLVHIA-----IMPKYSHLVRQNTEFWIASGYDFSLGWKG
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21.4%; Pred. No. 1.8;
cive 97; Mismatches 225; Indels 200;
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                                                                          IDENTIFICATION BY MASS SPECTROMETRY.
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Pfam; PF02470; mce; 1.
Transmembrane; Complete proteome.
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Science 269:496-512(1995)
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This SWISS-PROT entry is copyright. It is produced through a collaboration between the Swiss Institute of Bioinformatics and the EMBL outstation the European Bioinformatics Institute. There are no restrictions on its use by non-profit institutions as long as its content is in no way modified and this statement is not removed. Usage by and for commercial entities requires a license agreement (See http://www.isb-sib.ch/announce/or send an email to license@ib-sib.ch).
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                                                                                                                                                                                                                                                                                                                                                                                                                              Buchnera aphidicola (subsp. Acyrthosiphon pisum) (Acyrthosiphon pisum
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    331 KKKTIALNFNIDMKKRYFVKRIYFTGNEITQDRVLRRKIKQMEGKYFNTKLVELGKKLLE 390
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               GSG--NSLKVDIIKNDYQKYLDISTSYPYFFYNNADLNAFFFYNDFKYNFDNISNIIKNF 508
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   97 DNVKTMLRSKGYF----SSKVSLTE--KDGAYTVHITPGPRTKIANVGVAILGDILSDG 149
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      150 NLAEYYRNALENWQQPVGSDFDQDSWENSKTSVLGAVTRKGYPLAKLGNTRAAVNPD--- 206
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 NLFPYQKLITNLININPNEFYNRDKIDIIVNKITRFLSEYGYV----NTKVIVDPQIDH 330
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 KTKYFSDVKIIQKLNSYDSNQIDITYQVKEQTTGSINFGLGYGVDSGTSFNLAFSQDNIF 450
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      SEQUENCE FROM N.A.
STRAIN-TOKYO 1998;
MEDLINE-20445173; PubMed-10993077;
Shigenobu S., Watanabe H., Hattori M., Sakaki Y., Ishikawa "Genome sequence of the endocellular bacterial symbiont of
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Buchnera sp. APS.";
Nature 407:81-86(2000).
-1- SIMILARITY: BELONGS TO THE SURFACE ANTIGEN D15 FAMILY.
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9C91CA6D53BC27B8 CRC64;
                                                                                                                                                                                                                                                                                                                                                                                                                                                          symbiotic bacterium).
Bacteria; Proteobacteria; gamma subdivision; Buchnera.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            3.8%; Score 121.5; DB 1;
18.2%; Pred. No. 1.6;
tive 62; Mismatches 154;
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Pfam; PF01103; Bac_surface_Ag; I.
Hypothetical protein; Signal; Complete proteome.
                                                                                                                                                                                                                                                                                        16-OCT-2001 (Rel. 40, Last sequence update)
16-OCT-2001 (Rel. 40, Last annotation update)
Hypothetical protein BU237 precursor.
                                                                                                                                                                                              617 AA
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617 AA; 71807 MW;
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                                                                                                                                                                                              STANDARD;
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58;
                                                                                                                                                                                              Y237_BUCAI
P57331;
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K6PF_MOUSE STANDARD; PRT; 779 AA.
P47857. 99.K94. 035513;
P0-FEB-1996 (Rel. 33, Created)
16-CCT-2001 (Rel. 40, Last sequence update)
16-CCT-2011 (Rel. 40, Last annotation update)
16-CCT-2001 (Rel. 40, Last annotation update)
11) (Phosphohexokinase, muscle type (EC 2.7.1.11) (Phosphofructokinase)
PFKM OR PFK-M OR PFKA.
                                                                                                                                                                                                                                                                                                                                  394 VSKGGLHTVAVMNVGAPAAGMNAAVRSTVRIGLIQGNRVLVVHDGFEGLAKGQIEEAGW- 452
                                                                                                                                                                                                                                                                                                                                                                         MDKYETTLAAGISQPRNYRGNYWTSNVSYNRSTTQNLEKR---AFSGGIWYVRDR---- 388
                                                                                                                                                                                                                                                                                                                                                                                                            -----SYVGG-WTGQGGSKLGTKRTLPKKNLEQISANITKYNIQGLVII 495
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     496 GGFEAYTGGLELMEGRKQFDELCIPFVVIPATVSNNVPGSDFSIGADTALNTICTTCDRI 555
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            ----ASWKRQLLNNVLHPENGHYLDGKIGTTLG---TFLSSTALIRTSARAGYFFTPENK 475
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            SRKNVLGHMQQGGNPTPFDRNFA----TKMGAKATNWMSGKIKESYRNGRIFANTPDSGC 708
EVLDKEQTGFLAEEAPDNVKTMLRSKGYFSSKVSLTEKDGAYTVHITPGPRTKIANVGVA 140
                                                                       141 ILGDILSDGNLAEYYRNALENWQQPVGSDFDQDSWENSKTSVL----GAVTRKGYPLAKL 196
                                                                                                                                               197 GNTRAAVNP---DTATVDLNVVVDSGRPIAFGDFEITGTQRYPEQIVSGLARFQPGTPY- 252
                                                                                                                                                                                   277 DIKNLVVKRLGYDTRVTVLGHVQRGGTPSAFD--RILGS-RMGVEAVMALLEGTPDTPAC 333
                                                                                                                                                                                                                                                           334 VVSLSGNTAVRLPLMECVQVTKDVTKAMDEKRFDEAIKLRGRSFMNNWEVYKLLAHVRPP 393
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       ---PFTIRDLQVNVEHLVQKMKTTVKRGLVLRNEKCN--ENYTTDFIFNLYSEEGKGIFD 652
                                                                                                Mus musculus (Mouse).
Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Euteleostomi;
Mammalia; Eutheria; Rodentia; Sciurognathi; Muridae; Murinae; Mus.
                                                                                                                                                                                                                                                                                                  VK-----VSVTEV--KRHKLETGIRLDSEYGL--GGK--IAYDYYNLFNKGYIGSVVWD
                                  EIVDAITTTAQSHQRTFVLEVMGRHCGYLALVTSLS--CGADWVFIPECPPD-----
                                                                                                                                                                                                                        -----DLDLLLDFQQALEQNGHYSGASVQADFD---RLQGD------RVP
                                                                                                                                                                                                                                                                                                                                                                                                                                                 389 AGIDARLGAEFLAEGRK-----TMLT----
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             556 KOSAAGTKRRVF-----IIETMGGYCGYLATMAGLAAGADAAYIFEE---
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    476 KLGTFIIRG---QAGYTVARDNADVPSGLMFRSGGASSVRGYELDSI-GLAGPNG-SVLP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      STRAIN-CS7BL/GJ; TISSUE-Kidney;
MEDLINE-21085660; PubMed-11217851;
Kawai J., Shinagawa A., Shibata K., Yoshino M., Itoh M., Ishii
Arakawa T., Hara A., Fukunishi Y., Konno H., Adachi J., Fukuda Alakawa T., Izawa M., Nishi K., Kiyosawa H., Kondo S., Yamanaka
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              STRAIN=Swiss; TISSUE=Brain; Gunaskera D., Kemp R.G., "Kus musculus phosphofructokinase-1 A isozyme."; Submitted (MAR-2000) to the EMBL/GenBank/DDBJ databases.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         531 ERALLVGSLEY---QLPFTRTLSGAVFHDMGDAAANFKRMKLKH----
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 574 GLGVR----WFSPLAPFSFDIAYGHSDKKIRWHISL 605
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                                                P47858; 063736;
01-FEB1996 (Rel. 33, Created)
01-NOV-1997 (Rel. 35, Last sequence update)
16-OCT-2001 (Rel. 40, Last annotation update)
6-phosphofructokinase, muscle type (EC 2.7.1.11) (Phosphofructokinase
1) (Phosphohexokinase) (Phosphofructo-1-kinase isozyme A) (PFK-A).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  -1- ENZYME REGULATION: ALLOSTERIC ENZYME ACTIVATED BY ADP, AMP, OR FRUCTOSE BISPHOSPHATE AND INHIBITED BY ATP OR CITRATE.
-1- PATHMAX: KEY CONTROL STEP OF GLYCOLYSIS.
-1- SUBUNIT: HOMOTETRAMER.
-1- SIMILARIY: BELONGS TO THE PHOSPHOFRUCTOKINASE FAMILY. TWO DOMAIN SUBFAMILY.
                                                                                                                                                                               Rattus norvegicus (Rat).
Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Euteleostomi;
Mammalia; Eutheria; Rodentia; Sciurognathi; Muridae; Murinae; Rattus.
                                                                                                                                                                                                                                                                                                                               Ma Z., Ramanadham S., Turk J., Kempe K., Hu Z., Ladenson J.; "Characterization of expression of phosphofructokinase isoforms in Isolated rat pancreatic islets and purified beta cells and cloning and expression of the rat phosphofructokinase-A isoform."; Blochim. Blophys. Acta 1308:151-163(1996).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  72; Mismatches 247; Indels 188;
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                -1- CATALYTIC ACTIVITY: ATP + D-fructose 6-phosphate - ADP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Submitted (SEP-1996) to the EMBL/GenBank/DDBJ databases
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Submitted (NOV-1993) to the EMBL/GenBank/DDBJ databases
                                                                                                                                                                                                                                                                                              STRAIN-Sprague-Dawley, TISSUE-Pancreatic islets; MEDLINE-96350468; PubMed-876483;
                                779 AA.
                                  PRT;
                                                                                                                                                                                                                                                                                                                                                                                                                                                 REVISIONS TO 162-169 AND 493-497
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 fructose 1,6-bisphosphate.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             EMBL; U25651; AAC52786.1; -.
EMBL; D21869; BAA21013.1; -.
HSSP; P00512; 3PFK,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      SEQUENCE OF 7-212 FROM N.A.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Best Local Similarity 20.3 Matches 129; Conservative
                                  STANDARD;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              STRAIN-Sprague-Dawley;
                                                                                                                                                                                                                                                                            SEQUENCE FROM N.A.
                                                                                                                                                                                                                                      NCBI_TaxID=10116;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Nakajima H.
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Radota K., Matsuda H.A., Ashburner M., Batalov S., Casavant T.,
Radota K., Matsuda H.A., Ashburner M., Batalov S., Casavant T.,
Relatschmann W., Gasaterland T., Gissi C., King B., Kochiwa H.,
Ruehl P., Lewis S., Matsuo Y., Nikaido I., Pesole G., Quackenbush J.,
Ruehl P., Lewis S., Matsuo Y., Nikaido I., Pesole G., Quackenbush J.,
Rakal K., Okido T., Furuno M., Anno H., Baldarelli R., Barsh G.,
Blake J., Boffelli D., Bojunga N., Carninci P., de Bonaldo M.F.,
Rownstein M.J., Bult C., Fletcher C., Fujita M., Gariboldi M.,
Lyons P., Marchioni L., Mashima J., Manbaerts P.,
Rostone P., Ring B., Ringwald M., Roditucz I., Sakamoto N.,
Sasaki H., Sato K., Schoenbach C., Seya T., Shibata Y., Storch K.-F.,
Suzuki H., Toyo-oka K., Wang K.H., Metz C., Whittaker C., Wilming L.,
Wynshaw-Boris A., Yoshida K., Hasegawa Y., Kawaji H., Kohtsuki S.,
T. "Functional annotation of a full-length mouse cDNA collection.";
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 This SWISS-PROT entry is copyright. It is produced through a collaboration between the Swiss Institute of Bioinformatics and the EMBL outstation the European Bioinformatics Institute. There are no restrictions on its use by non-profit institutions as long as its content is in no way modified and this statement is not removed. Usage by and for commercial entities requires a license agreement (See http://www.isb-sib.ch/announce/or send an email to license@ilenseric.com
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     31;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      SIMILARITY: BELONGS TO THE PHOSPHOFRUCTOKINASE FAMILY. TWO DOMAIN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              ::|:: ; | |: :: | |: :----DDWEEHLCRRLSETRTRGSRLNIIIVAEGAIDKNGKPITSE 276
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      81 EVLDKEQTGFLAEEAPDNVKTMLRSKGYFSSKVSLTEKDGAYTVHITPGPRTKIANVGVA 140
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   141 ILGDILSDGNLAEYYRNALENWQQPVGSDFDQDSWENSKTSVL---GAVTRKGYPLAKL 196
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  9
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               -1- ENZYME REGULATION: ALLOSTERIC ENZYME ACTIVATED BY ADP, AMP, FRUCTOSE BISPHOSPHATE AND INHIBITED BY ATP OR CITRATE.
-1- PATHRAY: KEY CONTROL STEP OF GLYCOLYSIS.
-1- SUBUNIT: HOMOTETRAMER.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                       "Expression of mouse phosphofructokinase-M gene alternative transcripts: evidence for the conserved two-promoter system."; Biochem. J. 303:449-453(1994).
-!- CATALYTIC ACTIVITY; ATP + D-fructose 6-phosphate - ADP + D-fructose 1.6-bisphosphate.
-!- COFACTOR: MAGNESIUM.
                                                                                                                                                                                                                                                                                                                                                                                                    MEDLINE-95071243; PubMed-7980403; MEDLINE-95071243; PubMed-7980403; Nakajima H., Noguchi T., Hanaguchi T., Tomita K., Hanafusa T., Kono N., Tanaka T., Kuwajima M., Matsuzawa Y.;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     188;
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tive 71; Mismatches 247; Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  779 AA; 85137 MW; 4312D3E793AC63B5 CRC64;
                                                                                                                                                                                                                                                                                                                                                                     SEQUENCE OF 1-211 AND 258-344 FROM N.A.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        EMBL, AF249894; AAF63762.1; -... EMBL, AK002711; BAB22303.1; -... EMBL, D21864; BAA21892.1; -... EMBL, D21865; BAA21012.1; -... HSSP; PO0512; 3PFK... MGD; MGI:95788; PKm... InterPro; IPR000023; Ppfruckinase. Pfam; PF00365; PFK; 2.
                                                                                                                                                                                                                                                                                                                                Nature 409:685-690(2001).
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Matches 130;
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MOD_RES
SEQUENCE
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197 GNTRAAVNP----DTATVDLNVVVDSGRPIAFGDFEITGTQRYPEQIVSGLARFQPGTPYD 253
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SETRAIN-ATCC 15692 / PAO1;
MEDLINE-20437337; Pubmed-10984043;
SCOVER C.K., Pham X.-O.T., Erwin A.L., Mizoguchi S.D., Warrener P., Hickey M.J., Brinkman F.S.L., Hufnagle W.O., Kowalik D.J., Lagrou M., Galry L., Tolentino E., Westbrook-Wadman S., Yuan Y., Brody L.L., Coulter S.N., Folger K.R., Kas A., Larbig K., Lim R.M., Smith K.A., Spencer D.H., Wong G.K.-S., Wu Z., Paulsen I.T., Reizer J., Saier M.H., Hancock R.E.W., Lory S., Olson M.V.;
                                                                                                                                                                                                                                                                              453 -------SYVGG-WTGOGGSKLGTKRTLPKKNLEQISANITKFNIGGLVII 495
                                                                                                                                                                                                                                                                                                                                                                                                  ----ASWKRQLLNNVLHPENGHYLDGKIGTTLG---TFLSSTALIRTSARAGYFFTPENK 475
                                                                                                                                                                                                                                                                                                                                                                                                                                           597
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             531 ERALLVGSLEY---QLPFTRTLSGAVFHDMGDAAANFKRMKLKH------GS 573
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | ::| :: | | : | | | : | | | | SRXNVLGHWQQGGSPTPFDRNFA---TKMGAKAMNWMSGKIKESYRNGRIFANTPDSGC 708
                                                                                                           334 VVSLSGNQAVRLPLMECVQVTKDVTKAMDEKRFDEAIKLRGRSFMNNWEVYKLLAHVRPP
                                     DIKNLVVKRLGYDTRVTVLGHVORGGTPSAFD--RILGS-RMGVEAVMALLEGTPDTPAC
                                                                              LDLL-----LDFQQALEQNGHYSGASVQADFD---RLQGD-------RVP
                                                                                                                                                          VK-----VSVTEV--KRHKLETGIRLDSEYGL--GGK--IAYDYYNLFNKGYIGSVVWD
                                                                                                                                                                                     337 MDKYETTLAAGISQPRNYRGNYWTSNVSYNRSTTQNLEKR---AFSGGIWYVRDR----
                                                                                                                                                                                                                                                                                                                     389 AGIDARLGAEFLAEGRK------TMLT----
                                                                                                                                                                                                                                                                                                                                                          196 GGFEAYTGGLELMEGRKQFDELCIPFVVIPATVSNNVPGSDFSIGADTALNTICTTCDRI
                                                                                                                                                                                                                                                                                                                                                                                                                                                                              176 KLGTFIIRG---QAGYTVARDNADVPSGLMFRSGGASSVRGYELDSI-GLAGPNG-SVLP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   598 ---PFTIRDLQVNVEHLVQKMKTTVKRGLVLRNEKCN--ENYTTDFIFNLYSEEGKGIFD
                                                                                                                                                                                                                                                                                                                                                                                                                                       556 KQSAAGTKRRVF-----IIETMGGYCGYLATMAGLAAGADAAYIFEE---
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          MEDLINE-93328663; PubMed-8335619; Poole K., Neshat S., Krebes K., Heinrichs D.E.; "Cloning and nucleotide sequence analysis of the ferripyoverdine receptor gene fpvA of Pseudomonas aeruginosa."; J. Bacteriol. 175:4597-4604(1993).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Bacteria; Proteobacteria; gamma subdivision; Pseudomonadaceae;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Lamont I.L.; Submitted (MAR-1994) to the EMBL/GenBank/DDBJ databases.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           PPVA_PSEAE STANDARD; PRT; 815 AA. P48632; 051339; 01-F88-1996 (Rel. 33, Created) 1-CCT-2001 (Rel. 40, Last sequence update) 15-JUN-2002 (Rel. 41, Last annotation update) Ferripyoverdine receptor precursor.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         574 GLGVR----WFSPLAPFSFDIAYGHSDKKIRWHISL 605
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          709 VLGMRKRALVFQPVTELKDQTDFEHRIPKEQWWLKL 744
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Pfam; PF02708; rOmpA_rOmpB;
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86
86
1103
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                                                                                                                                                                                                        NCBI_TaxID=783;
                                                                                                   120K_RICRI
P14914;
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CARBOHYD
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                                                                                 RESULT 16
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                                                                                                 This SWISS-PROT entry is copyright. It is produced through a collaboration between the Swiss Institute of Bioinformatics and the EMBL outstation the European Bioinformatics Institute. There are no restrictions on its use by non-profit institutions as long as its content is in no way modified and this statement is not removed. Usage by and for commercial entities requires a license agreement (See http://www.isb-sib.ch/announce/or send an email to license@lsb-sib.ch).
                                                                                                                                                                                                                                                                                                                                                                                              30;
                                                                                                                                                                                                                                   Pfam: PF00593; TonB_boxC: 1
PROSITE; PS00430; TONB_DEPENDENT_REC_1; FALSE_NEG.
PROSITE; PS01156; TONB_DEPENDENT_REC_2; 1.
Outer membrane; Iron transport; Transport; TonB box; Signal; Receptor;
       RIVFANLEHNFANGWVGKVQLDHKINGYH-----APLGAIMGDWPAPDNSAKIVAQKYT 449
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           389 AGIDAR---LGAEFLAEGRKIP--GSDIDLGNSHAT------MLTASWKRQLLNNVLH 435
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             RVVDYRVTGLNPTIRESGRFIPYVGAVYDLNDTYSVYASYTDIFMPQDSWYRDSSNKLLE 609
                                                                                                                                                                                                                                                                                                                                                                                                                                                        KDGAYTVHITPGPRTKIANVGVAILGDILSDGNLAEYYRNALENWQQPVGS-----DFDQ 172
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         -VNPDTATVDLNVVVD-----SGRPIAFGDFEITGTQRYPEQIVSGLARFQPGTPYD 253
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             DLNPDTM----LTVGADYQDNDPKGSGWSGSFPLFDSQGNRNDVSRSFNNGAKWSSWEQYT 395
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    436 PE------NGHYLDGKIGTTLGTFLSSTALIRTSARAGYFFTPENKKLGTFIIRG-- 484
                                                                                                                                                                                                                                                                                                                                                                                                                 DMVEEHLPLITQQQEEVLDKEQTGFLAEEAP-----DNVKTMLRSKGYFSSKV--SLTE 117
                                                                                                                                                                                                                                                                                                                                                                                                                                     DDVMRHTPGIT---VSAYDTDRNNYYARGFSINNFQYDGIPSTARNVGYSAGNTLSDMAI 242
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          TEVKRHKLE---TG----IRLDSEYGLGGKIAYDYYNLFNKGYIGSVVWDMDKYETTLAA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      243 YDRVEVLKGATGLLTGAGSLGATI-----NLIR-----KKPTHEFKGHVELGA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     286 GSWDNYRSELDVSG-----PLTESGNVRGRAVAAYQDKHSFMDHYERKTSVYYGILEF
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  LDLLLDFQQALEQ------RGHYSGASVQADFDRLQGD-----RVPVKVSV
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                                                                                                                                                                                                                                                                                                                                                                          DB 1; Length 815;
of Pseudomonas aeruginosa PAO1, an
                                                                                                                                                                                                                                                                                                                                                                                              Indels
                                                                                                                                                                                                                                                                                                  FERRIPYOVERDINE RECEPTOR.
TONB C.TERMINAL BOX.
Y -> F (IN REF. 1).
MISSING (IN REF. 1).
S -> R (IN REF. 1).
                                                                                                                                                                                                                                                                                                                                                     AllaE4AA5A290F35 CRC64;
                                                                                                                                                                                                                                                                                                                                                                                            68; Mismatches 192;
                                                                                                                                                                                                                                                                                                                                                                                   Pred. No. 3.8;
                                                                                                                                                                                                                                                                                                                                                                        3.7%; Score 118.5;
19.5%; Pred. No. 3.8
                                                                                                                                                                                                                                                                                          POTENTIAL
                                                                                                                                                                                                       EMBL; AE004666; AAG05786.1; -. PIR; A40601; A40601. InterPro; IPR000531; TonB_boxC.
                                                                                                                                                                                                                                                                                         43 PG
815 FB
815 TC
716 Y
750 M
                                                                                                                                                                                    EMBL; L10210; AAA25819.1; -.
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                                                                                                                                                                                                U07359; AAB60199
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798
716
745
750
815 AA;
                                                                                                                                                                                                                                                                              Complete proteome.
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Matches 112;
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CONFLICT
SEQUENCE
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"Cloning, expression and sequence analysis of the gene encoding the "Cloning, expression and sequence analysis of the gene encoding the 120 kD surface-exposed protein of Rickettsia rickettsii."; Mol. Microbiol. 3:1579-1586(1989).

-i- FUNCTION: MAJOR STRUCETRAL PROTEIN WHICH MAY PLAY A ROLE AS RICKETTSIAL VIRULENCE FACTOR AND/OR IMMUNOGEN DURING INFECTION.

-1- SUBCELLULAR LOCATION: CELL WALL. THIS BACTERIUM IS COVERED BY A
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        S-LAYER WITH HEXAGONAL SYMMETRY.
MISCELLANEOGIS: ITS C-TERMINUS POTENTIALLY MAY BEAR THE EPITOPES
CONFERRING ANTIGENICITY TO THE PROTEIN.
SIMILARITY: BELONGS TO THE RICKETTSIAE OMPA/OMPB FAMILY.
                                                                                                                                                                                                                                                                                                                                                                                                                                           Rickettsia rickettsii.
Bacteria; Proteobacteria; alpha subdivision; Rickettsiales;
Rickettsiaceae; Rickettsieae; Rickettsia.
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01-FEB-1996 (Rel. 33, Last sequence update)
15-JUN-2002 (Rel. 41, Last annotation update)
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                                                                                                                                                                                                                                                                                                                                                                                          120 kDa surface-exposed protein
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Matches 117; Conserv
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30-MAY-2000 (Rel. 39, Last sequence update)
16-CCT-2001 (Rel. 40, Last annotation update)
Outer membrane protein B precursor (168 kba surface-layer protein)
(Surface protein antigen) (Cell surface antigen 5) (Sca5) (rOmpB)
(rOmp B) [Contains: 120 kba surface-exposed protein (Surface protein antigen) (120 kba outer membrane protein ompB); 32 kba beta peptide].
                                                                                                                                                    LPLITQQQEEVLD-----KEQTGFLAEEAPDNVKTMLRSKGYFSSKVSLTEKDGAYTVH 125
                                                                                                                                                                       IKLTSTONNIVVDFDLAIATDQTGVVDASSLTNAQTL-----TINGKIG---- 262
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                                                                                                             Length 1300;
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Rickettsiaceae; Rickettsieae; Rickettsia.
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                                                                                                                       Pred. No. 9.7;
92; Mismatches 248;
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                                                   Gilmore R.D. Jr., Cieplak W. Jr., Policastro P.F., Hackstadt T.; "The 120 kilodalton outer membrane protein (rOmp B) of Rickettsia tracettsii is encoded by an unusuually long open reading frame: evidence for protein processing from a large precursor."; Mol. Microbiol. 5:2361-2370(1991).
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Gloning, expression and sequence analysis of the gene encoding "Cloning, expression and sequence analysis of the gene encoding to be surface-exposed protein of Rickettsia rickettsii., Mol. Microbiol. 3:1579-1586(1989).

-1- FUNCTION: THE 120 kDa SURFACE-EXPOSED PROTEIN IS A MAJOR STRUCTURAL PROTEIN MICH MAY PLAY A ROLE AS A RICKETTSIAL VIRULENCE FACTOR AND/OR IMMUNOGEN DURING IMPECTION.
-1- SUBCELLULAR LOCATION: CELL WALL. THIS BACTERIUM IS COVERED FLAYER WITH HEXAGONAL SYMMETRY.
-1- SIMILARITY: BELONGS TO THE RICKETTSIAE OMPA/OMPE FAMILY.
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Mismatches 248;
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MEDLINE-90136087; PubMed-2515418;
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Pfam; PF02708; rOmpA_rOmpB; 1.
Antigen; S-layer; Cell wall.
MEDLINE-92167802; PubMed-1724278;
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-----ATNATINDGVTVTTGGIAGI-GFD-GKITLGSVNGNGNVRFADGILSNST 1054
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MEDLINE-20150255; PubMed-10684935;
Read T.D., Brunham R.C., Shen C., Gill S.R., Heidelberg J.F.,
Read T.D., Brunham R.C., Shen C., Gill S.R., Heidelberg J.F.,
White O., Hickey E.K., Peterson J., Utterback T., Berry K., Bass S.,
Linher K., Weidman J., Khouri H., Craven B., Bowman C., Dodson R.,
Gwinn M., Nelson W., DeBoy R., Kolonay J., McClarty G., Salzberg S.L.,
Eisen J., Fraser C.M.,
"Genome sequences of Chlamydia trachomatis MoPn and Chlamydia
Pneumoniae AR39.";
Nucleic Acids Res. 28:1397-1406(2000).
                                                                                                                                                                                                                                                                                                                                          PMP1_CHLPN STANDARD; PRT; 922 AA.
0929G5; 09K1Y9; 09Z4H9;
16-OCT-2001 (Rel. 40, Last sequence update)
16-OCT-2001 (Rel. 40, Last annotation update)
16-OCT-2001 (Rel. 40, Last annotation update)
Probable outer membrane protein pmp1 precursor (Polymorphic membrane
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Shiral M., Hirakawa H., Kimoto M., Tabuchi M., Kishi F., Ouchi K., Shiba T., Ishii K., Hattori M., Kuhara S., Nakazawa T.; Comparison of Whole genome sequences of Chlamydia pneumoniae J138 from Japan and CWLO92 from USA."; Nucleic Acids Res. 28:2311-2314(2000).
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                                                                                                                                                                                                     SMIGTȚKANNGTVTYLGNAFVGNIGDSDTPVASVRFTGSDSGAGLQGNIYSQVIDF 1110
                                                                      482 IRGOAGYTVARDNADVPSGLMFRSGGASSVRGYELDSIGLAGPNGS-----VLPERA
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-!- SIMILARITY: BELONGS TO THE PMP OUTER MEMBRANE PROTEIN FAMILY.
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PMP1 OR OMP6 OR CPN0005 OR CP0770.

Chlamydia pneumoniae (Chlamydophila pneumoniae).

Bacteria: Chlamydiales; Chlamydiaceae; Chlamydiaphila.
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             WTSNVSYNRSTTQNLEKRAFSGGIWYVRDRAGIDAR------LGAEFLA--EG 403
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         -----TIPQNVN---LSAGYLVIKEGAEVTVSKFTQSPGSHLVLDLGTKLIASKED 473
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   211 IRFAQNTAKNGSGGALYS-----DGDIDIDQNAYVLFRENEALTTAIGKGGAVCCLPTS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       -----ENWQQPVG-----SDFDQDSWENSKTSVLGAVTRKGYPL----
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          IAITGLAIDIDSLSSSTAAVIKANTANKQISVTDSIELISPTGNAYEDLRMRNSQTFPL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       594 NLVPNILWGNA-----VDVRSLMQVQETHASSLQTDRGLWIDGIGNFFHVSASEDNI
                                                                                                                                                                                                                                                                                                                                                                                             PROBABLE OUTER MEMBRANE PROTEIN PMP1.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           -----AKLGNTRAAVNPDTATVDLNVVVDSGRPIAFGDFEITGTQRYPEQIVSGLARF
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  QPGTPYDLDLLLDFQQALEQNGH--YSGASVQADFDRLQGDRVPVKVSVTEVKRHKLETG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         ; Pred. No. 6.5;
83; Mismatches 226; Indels 268;
                                                                                                                                                                                                                                                                                                                                  Signal; Multigene family; Complete proteome.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         DB 1; Length 922;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               TISTEGNIERYASRNPNVNVGILSRRFLONPLMIFHFLCAYGHATNDMK 748
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               TF---IIRGQAGYTVARDNADVPSGLMFRSGGASSV---RGYELDSIG--
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 100457 MW; DFF2AB6333AB031C CRC64;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 404 RKIPGSDIDLGNSHATMLTASWKRQLLN------NVLHPENGHYLD-
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             GDAAANFKRMKLKHGS - - - GLGVRWF - - SPLAPFSFDIAYGHSDKKIR
                                                                                                                                                                                                                                                                                                                                                                                                                      F -> L (IN REF. 1
Y -> C (IN REF. 1
D -> N (IN REF. 1
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         3.7%; Score 116;
18.5%; Pred. No. 6
email to license@isb-sib.ch)
                                                                                                                                                                                                        Interpro; IPR003368; Chlamydia_PMP.
Interpro; IPR003357; OMP.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      IRLDSEYGLGGKIAYD-------
                                                  EMBL; AJ133035; CAB37075.1; -. EMBL; AE001585; AAD18163.1; -. EMBL; AE002237; AAF38570.1; -. EMBL; AP002545; BAA98215.1; -.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Best Local Similarity 18.5% Matches 131; Conservative
                                                                                                                                                                                                                                                                Pfam; PF02385; OMP; 1.
Pfam; PF02415; DUF145; 1.
                                                                                                                                                                                                                                                                                                                                                                 26
922
14
375
606
                                                                                                                                                                                                                                                                                                                                                                                                                                                  375
606
922 AA;
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us-09-857-669-2.rsp

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1578
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      32;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               : :: | | :: ; ; | | :: ; ; | 1370 LXINGGGRNEDFKINIGHIETP------AVFSSHATISGSRGDIIDYLLKIMRTANP- 1420
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          --NGNFKLVIKDSIAANGOYKVTDADGKGNGLIIIDFKKINRK----IKGDVRFTAKE 1472
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           1473 PVFNADIDLFLNFEKDNSDKVHFSTYNKKTDKVMDTKNKLEYAGKRTEVNIHODGILAVT 1532
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               194 AKLGNTRAAVNPDTATVDLNVVVDS---GRPIAFGDFEITGTQRYPEQIVSGLARFQPGT 250
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          85 KEQTGFLAEEAPDNVKTMLRSKGYFSSKVSLTEKDGAYTVHITPGPRTKIANVGVAILGD 144
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             145 I-LSDGNLAEYYRNALENWQQPVGSDFDQDSWENSKTSVLGA------VTRKGYPL 193
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     304 G-----IRLDSEYGLGGKIAYD-----YYNLFNKGYIGSVVWDMDKYETTLAAGISQ 350
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      PRNYRGNYWTSNVSY - NRSTTQNLEKRA - - FSGGI - WYVRDRAGIDARLGAEFLAEGRKI 406
                                                                                                   Manduca sexta (Tobacco hawkmoth) (Tobacco hornworm).
Eukaryota; Metazoa; Arthropoda; Mandibulata; Pancrustacea; Hexapoda;
Insecta; Pterygota; Neoptera; Endopterygota; Lepidoptera; Glossata;
Ditrysia; Sphinglodea; Sphingldae; Sphinginae; Manduca.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          28 ENKAAGFALFKN---KSPDTESVKLKPKFPVRIDTQDSEIKDMVEEHLPLITQQQEEVLD 84
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  251 PY --- DLDLLLDFQQALEQNGHYSGASVQADFDRLQGDRVPVKVSVTEVKRHK ---- LET
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             GKAHTVAELVLPTERCLSLKIDHDGAFKDGLYN----GHMDMTISDAPK-----
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Indels 153;
                                                                          Apolipophorins precursor. [Contains: Apolipophorin-I (APOLP-1); Apolipophorin-II (APOLP-2)].
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Length 3305;
                                                                                                                                                                                                               Sundermeyer K., Hendricks J.K., Pressad S.V., Wells M.A.;
"The precursor protein of the structural apolipoproteins of lipophorin: cDNa and deduced amino acid sequence.";
Insect Blochem. Mol. Biol. 26:735-738(1996).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                3305 AA; 366941 MW; B27D611410285FD7 CRC64;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  232;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           DB 1;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           POTENTIAL.
APOLIPOPHORIN-II.
APOLIPOPHORIN-I.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     -
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-
                                     01-NOV-1997 (Rel. 35, Created)
01-NOV-1997 (Rel. 35, Last sequence update)
16-OCT-2001 (Rel. 40, Last annotation update)
              3305 AA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Local Similarity 19.4%; Pred. No. 48; es 118; Conservative 106; Mismatches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         3.6%; Score 114.5;
                                                                                                                                                                                                                                                                                                                                                                                                             InterPro; IPR001747; Lipid_transprt_N.
InterPro; IPR001846; VWF_D.
              PRT;
                                                                                                                                                                                          TISSUE-Fat body;
MEDLINE-97166603; Pubmed-9014323;
                                                                                                                                                                                                                                                                                                                                                                                                                                    Pfam; PF00094; vwd; J. Pfam; PF01347; Vitellogenin_N; J. SMART; SM00216; VWD; J. Signal.
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-:-
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              STANDARD;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              23
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   3305
                                                                                                                                                                               SEQUENCE FROM N.A.
                                                                                                                                                   NCBI_TaxID=7130;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                SEQUENCE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Query Match
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            SIGNAL
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APLP_MANSE
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                                                                                                                                                                                                                              01-AUG-1991 (Rel. 19, Created)
01-DEC-1992 (Rel. 24, Last sequence update)
16-OCT-2001 (Rel. 40, Last annotation update)
Genome polyprotein M (Contains: Coat protein VP37; Coat protein VP23].
Bean-pod mottle virus (strain Kentucky G7) (BPMV).
Viruses; ssRNA positive-strand viruses, no DNA stage; Comoviridae;
----RGS-GASTISYKGKVSNSNLDQEIIDYEGQINFKLKDGKNLQSTFSLKNNPDGDKF 1632
                                                                                                                                                                                                                                                                                                                                                            1743 INADVYKIDANGKVGPKNGYGAV----KVLVPHVE----PFVLDYNYKSSHE-GEKNNNYV 1794
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         "Analysis of the nucleotide sequence of bean pod mottle virus middle
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      -1- PTM: SPECIFIC ENZYMATIC CLEAVAGES IN VIVO YIELD MATURE PROTEINS.
                                                                                                          1633 KYEFKSDVN-GNIIPKPANLVATGTYSNSENEI---DETYRLKGSYGSDIGFELAGVGTI
                                                           P---GSDIDLGN---SHATMLTASWKRQLLNNVLHPENGHYLDGKIGTTLGTFLSSTALI
                                                                                                                                                                                      RTSARAGYFFTPENKKLGTF11RGQAGYTVARDNADVPSGLMFRSGG-----ASSVR
                                                                                                                                                                                                                                                                                                                     ----GYELDSIGLAGPN---GSVLPERALLVGSLEYQLPFTRTLSGAVFHDMGDAAANFK
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Science 245:154-159(1989).
-1- SUBUNIT: THE VIRUS CAPSID IS COMPOSED OF 60 ICOSAHEDRAL UNITS, EACH OF WHICH IS COMPOSED OF ONE COPY EACH OF THE TWO COAT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             X-RAY CRYSTALLOGRAPHY (3.0 ANGSTROMS) OF 447-1018.
MEDLINE-89317459; PubMed=2749253;
Glen Z., Stauffacher C., Li Y., Schmidt T., Bomu W., Kamer G.,
Shanks M., Lomonossoff G., Johnson J.E.;
"Protein-RNA interactions in an icosahedral virus at 3.0-A
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Polyprotein; 3D-structure,
COAT PROTEIN VP37,
COAT PROTEIN VP23.
C DOMAIN,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Ä.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        MEDLINE-91272504; PubMed-2053290;
Macfarlane S.A., Shanks M., Davies J.W., Zlotnick
Lomonossoff G.P.;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              PRT; 1018 AA.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             InterPro; IPR003181; Como_LCP.
InterPro; IPR003182; Como_SCP.
Pfam; PF02247; Como_LCP; I.
Pfam; PF02248; Como_SCP; 1.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             EMBL; M62738; AAA42801.1; -.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Coat protein; Glycoprotein;
CHAIN 447 820
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Virology 183:405-409(1991).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              STANDARD;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         PDB; 1BMV; 15-OCT-91.
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1795 ELKTKYGKG 1803
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                                                                                                                                                                                                                                                                                                                                                                                                                                                566 RMKLKHGSG 574
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               NCB1_TaxID=31715;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             component RNA.";
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                                                           407
                                                                                                                                                                                                                                                                                                                     513
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228
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     425
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                                                                                                                                                                     Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               69 EEHLPLITQQQEEVLDKEQTGFLAEEAPDNVKTMLRSKGYFSSKVSLTEKDGAYTVHITP
                                                                                                                                                                                                                169 DFDQDSWENSKTSVLGAVTRKGYPLAKLGNTRAAVNPDTATVDLNVVVDSGRPIAFGDFE
                                                                                                                                                                                                                                                                                                                           244 IVGAMLLVDTYHTNPENAVRSIFVAPFRGGRPI---RVVTFPNTIVQIEPDMNSRFQLLS
                                                                                                                                                                                                                                                                                                                                                                                                                                        TTTNGDFVQGKDLAMVKVNVACAAVGLTSSYTPTPLLESGLQKDRGLIVEY--FGRMSY-
                                                                                                                                                                                                                                                                                                                                                                                                                                                                             321 YYNLFNKGYIGSVVWDMDKYETTLAAGISQPRN---YRGNYWTSNVSYNRSTTQNLEKRA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     378 FSGGIWYVRDRAGIDARLGAEFLAEGRKIPGS------DIDLGNSHATMLTASW
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               FVSGRTFKYDIIGAGSQSSEELSEE--KIQGKAKQVDARLRQRIDPQYNEVQAQMETNLF
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            KRQLLNNVLHPENGHYLDGKI------GTTL-----GTFLSSTALIR
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  129 GPRTKIANVGVAILGD--ILSDGNLAEYYRNALEN-------WQQPV-----GS
                                                                                                                                                                                                                                                                                                                                                                 229 ITGT-----ORYPEQIVSGL--ARFQPGTPYDLDLLLDFQQALEQ----NGHYSGAS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 TSARAGYF-----FTPENKKLG-----PFIIRGQAG---YTVARDNADV-----PSG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Proteus mirabilis.
Bacteria; Proteobacteria; gamma subdivision; Enterobacteriaceae;
                                                                                                                                                                   Indels 195;
                                                                                                                                         Length 1018;
                                                                                                              113351 MW; B11B35D0A7F0F872 CRC64;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              LEYQLPF - - TRTLSGAVFHDMGDAAANFKRMKLKHGSGLGVR 578
                                                                                                                                         DB 1;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            LNPQNPFVLNRWMGKLTFPQ--GTSRSVKRMPLSIGGGAGAK
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        PICAL PROMI STANDARD; PRT; 1577 AA. P16466; 01-AUG-1990 (Rel. 15, Last sequence update) 01-NOV-1990 (Rel. 16, Last annotation update)
                                                                                                                             3.6%; Scor.
20.9%; Pred. No. 11.
78; Mismatches '
                                                                                                                                                                   Matches 134; Conservative
 961
972
976
986
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     28;
                                                                                                                                                                                                                                 -!- SUBCELLULAR LOCATION: Outer membrane.
-!- MISCELLANEOUS: THE CONSERVED AMPHIPATHIC DOMAINS IN SHLA AND HPMA
MAY BE RESPONSIBLE FOR PORE FORMATION.
-!- SIMILARITY: TO S.MARCESCENS HEMOLYSIN (SHLA).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              SKDYGGGFNAGTTHHSKEQTTAKVGTITGSQGIELNAGHNLTLQGTHLSSEQDIALNATN 1164
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      139 VAILGDILSDGN---LAEYYRNALENWQQPVGSDFDQDSWENSKTSVLGAVTRKGYPLAK 195
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 QTGFLAEE---APDNVKTMLRSKGYFS----SKVSLTEKDGAYTVHITPGPRTKIANVG 138
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   -----KTDSLNVGIDVGVNLDYSGV----TKPVKKAIEDGVNTTKPGNNTDLT 900
                                            SAGFHITHTTNKNTSTETEQAN-STISGANVDLQAN--KDVTFAGSDLKTTAGNASITGD 753
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              31 AAGFALF----KNKSPDTESVKLKPKFPVRIDTQDSEIKDMVEEHLPLITTQQQEEVLDKE 86
                                                                                                                                                                                                   ERYTHROCYTES BY INTERACTION WITH THE ERYTHROCYTE MEMBRANE. HPMA REQUIRES HPMB FUNCTION.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        KIAYDYYN-LFNKGYIGSVVWDMDKYETTLAAGISQPRNYRGNYWTSNVSYNRSTTQNLE
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          --VLHPENGHY----LDGKIGTTL------GTFLSSTALIRTSARAGYFFTPE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   LGNTRAAVNPDTATVDLNVVVDSGRPIAFGDFEITGTQRYPEQIVSGLARFQPGTPYDLD
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      LLLDFQQALEQNGHYSGASVQADFDRLQGDRVPVKVSVTEVKRHKLETGIRLDSEYGLGG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      901 KKVTARDAIAN-----LANLSNLETPNVGVEVGIKGGGSQQSQTDSQAVSTSINAG
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Length 1577;
                                                                                                                                                                                  FUNCTION: CELL-BOUND HEMOLYSIN, WHICH RELEASES HEME-IRON
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               30 1577 HEMOLYSIN.
1577 AA; 165869 MW; 175975E0C924B2D9 CRC64;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             811 TEVAGDLTITANKDLLHEGASHHVEGRYQESGENIQHLAVNDSETS-----
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   264;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                3.6%; Score 113.5;
21.6%; Pred. No. 20;
tive 75; Mismatches
 SEQUENCE FROM N.A., AND SEQUENCE OF 30-43. STRAIN-ISOlate 477-12;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Hemolysis; Toxin; Outer membrane; Signal.
                               MEDLINE-90170827; PubMed-2407716;
                                                                                                                                                                                                                                                                                                                                                                                                                                                        EMBL; M30186; AAA25657.1; -.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Matches 133; Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Similarity
                                                                                                                                                                                                                                                                                                                                                                                                                                                                               PIR; A35140; A35140
                                                                                                                                                                  DEFINED
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   28;
                      HYPOTHETICAL OUTER MEMBRANE USHER PROTEIN
GSVLPERALLVGSLEYQLPFTRTLSGAVFHDMG----DAAANFKRMKLKHGSGLGVRWFS 581
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            141 ILGDILSDGNLAEYYR-----NALENWQQPVGSDFDQDSWENSKTSVLGAVTRKG 190
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      310 YVIYQ-----SNVSAGAFEINDLYPSSNS---GDLEVTIEESDGTQR------R 349
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              pred. No. 8.8;
63; Mismatches 166; Indels 244; Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           -1- FUNCTION: COULD BE INVOLVED IN THE EXPORT AND ASSEMBLY OF THE PUTATIVE YRAH FIMBRIAL SUBUNIT ACROSS THE OUTER MEMBRANE.
                                                                                                                                                                                                                                                                                                                                                                                                              MEDLINE-97426617; Pubmed-9278503;
Blattner F.R., Plunkett G. III, Bloch C.A., Perna N.T., Burland V.,
Ralley M., Collado-Vides J., Glasner J.D., Rode C.K., Mayhew G.F.,
Gregor J., Davis N.W., Kirkpatrick H.A., Goeden M.A., Rose D.J.,
Mau B., Shao Y.,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               254 LLGESATSGSIFSSYTFTGVQLASDDNMLPNSQR----GFAPTVRGIANSSAIVTIRQNG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               191 YPLAKLGNTRAAVNPDTATVDLNVVVDSGRPIAFGDFEIT----GTQRYPEQIVSGLAR
                                                                                                                                                                                                                                                                                                Escherichia coli.
Bacteria; Proteobacteria; gamma subdivision; Enterobacteriaceae;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             (By similarity).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             PROSITE; PS01151; FIMBRIAL_USHER; 1.
Hypothetical protein; Outer membrane; Transmembrane; Fimbria;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                3.6%; Score 113; DB 1; Length 838; 18.3%; Pred. No. 8.8;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                "The complete genome sequence of Escherichia coll K-12."; Science 277:1453-1474(1997).
                                                                                                                                                                                                                               (Rel. 32, Last sequence update)
(Rel. 40, Last annotation update)
outer membrane usher protein yraJ precursor.
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InterPro; IPR000015; Fimb_usher.
                                                                                                                                                                                                             01-NOV-1995 (Rel. 32, Created)
01-NOV-1995 (Rel. 32, Last seq
16-OCT-2001 (Rel. 40, Last ann
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838 AA;
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Matches 106; Conserv
                                                                                                                                                                                                                                                                                                                                                                               SEQUENCE FROM N.A.
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P42915;
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NCBI_TaxID=1329;
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DNA Seq. 4:325-
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Q53957;
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            22;
                                                                                                                                                                                                                                               | :|| :|| :|| STANSY QMTSQKDRPTQHEMRLDGSLLDDGRLSYSLEQSLDDDNNHNSSLNASYRSPYGTFS 639
                                                                                                                                                                                     ODYWGNNDKNRNISVGVSGQQWGVGYSLNYQYSRYTDQN-NDRALSLNLSIPLERWLPRS 579
                                                                                                                                                                                                                                                                                                               640 AGYSYGNDSSQYNYGVTGGVVIHPH-----GVTLSQYLGNAFALIDANGASGVRIQ 690
                                                                                                                                                                                                                                                                                                                                           F-QPGTPYDLDLLLDFQQALEQNGH--YSGASVQADFDRLQGDRVPVKVSVTEV---KR 298
                          350 FIQPYSSLPM------MORPGHLKYSATAGRYRADANSDSKEPEFAEATAIYGLNNT 400
                                                                                 401 FTLYGGLLGSEDYYALGIGIGGTLGALGALSMDINRADTQFDNQHSFHGYQWRTQYIKDI 460
                                                                                                                                                                     RNYRGNY------WYVRD 387
                                                                                                                                                                                                                                                                                    NYPGIATDPFGYAVVPYLTTYQENRLSVDTTQLPDNVDLEQTTQFVVPNRGAMVAARFNA 750
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Storey C.C., Lusher M., Richmond S.J.;
"Analysis of the complete nucleotide sequence of Chpl, a phage which infects avian Chlamydia psittaci.";
J. Gen. Virol. 70:3381-3390(1989).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Gaps
                                                                                                                                         461 PETNINIAVSYYRYINDGYFSFNEANTRNWDYNSROKSEIOFNISQIIFDGVSLYASGSQ
                                                                                                                                                                                                                          RAGI------DARLGAEFLAEGRKIPG--SDIDLGNSHATMLTASWKRQL---
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      TO F PROTEIN OF PHAGE PHI-X174, AA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           79;
                                                                                                                 ----TTLAAGIS---
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                DB 1; Length 595;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  RESIDUES 2-58,
AE71D8024EA967ED CRC64;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          3.5%; Score 111.5; DB 1;
23.5%; Pred. No. 6.8;
Live 55; Mismatches 214;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Viruses; ssDNA viruses; Microviridae; Microvirus.
NCBI_TaxID=12367;
                                                                                                                                                                                                                                                                                                                                                                                                                      DVPSGLMFRSGGASSVRGYELDSIGLAGPNGSVLPERAL 534
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            01-NOV-1990 (Rel. 16, Created)
01-NOV-1990 (Rel. 16, Last sequence update)
15-JUL-1998 (Rel. 36, Last annotation update)
                                                                                                              ----KIAYDYYNLFNKGYI----GSVVWDMDKYE---
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      595 AA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              SEQUENCE FROM N.A., AND SEQUENCE OF 1-20
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             MEDLINE-90111716; PubMed-2607341;
                                                      HKLETGIRLDSEY ---- GLGG----
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 66850 MW;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           EMBL; D00624; BAA00515.1; -. PIR; JU0345; JU0345. Structural protein.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Matches 107; Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      STANDARD;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 595 AA;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Similarity
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P19192:
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SIMILAR
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Best Local 9
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14 FFFPHAYAPAADLSENKAAGFALFKNKSPDTESVKLKPKFPVRIDTQDSEIKDMVEEHLP 73

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                                                                                                                                                                                                                                                                          235
:| :| :| : : | : | 117 YFVPQVTSPDGGXAENSITDYFGLPTKVANYRH-QVLPLRAYNLIFNEYYRDENLQESLP 175
                                                                                                                                                                                                                                                                                                                           331
                                                                                                                                                                                                                                                                                                                                                                       236 PEQIVSGLARFQPGTPYDLDLLLDFQQALEQNGHYSG---ASVQADFDRLQGD----RVPV 289
                                                                                                                                                                                                                                                                                                                                                                                                                                                                      -----KVSVTEVKRHKLETGIRLDSEYGLGGKIAY----DYYNLFNKGYI--GSVVWD 336
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           442 LSATADLTYQQGLERQWSRFSRY-DYYWPTFAHLGEQPVYNKEIYCQSDTVMDPSGSAVN 500
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            MEDLINE-95102113; PubMed-7803818; Okumura K., Hara A., Tanaka T., Nichiguchi I., Minamide W., Igarashi H., Yutsudo T.; Cloning and sequencing the streptolysin O genes of group C and group
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Seq. 4:325-328(1994).

FUNCTION: SULFHYDRYL-ACTIVATED TOXIN. IS ABLE TO LYSE CHOLESTEROL CONTAINING MEMBRANES. CAN BE REVERSIBLY INACTIVATED BY OXIDATION. CHOLESTEROL IS THE RECEPTOR FOR THE BINDING OF THESE TOXINS TO EUKARYOTIC CELL MEMBRANES.
                                                                                                                                                                          184
                                                                                                                                                                                                                         284
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         MD-----KYETTLAAGISQPRNYRGNYWTSNVSYNRSTTQNLEKRAFSGGIWYVRDRAGI 391
                                                                                                                      176 VWTGDADPKVD-PTTGEESQEDDAVPYVYKLMRRNKRYDYFTSALPGLQKGPSVGIGITG 234
                                                                                                                                                                                                                         GDSGRLPVHGLAIRSYLDDSSDDQFSFGVSYVNASQKW-----FTAD---GRLTSGMG
                                                                        LITOOOEEVLDKEQTGFLAEE---APDNVKTMLRSK--GYFSSKVSLTEKDGAYTVHITP
                                                                                                                                                                        GPRTKIANVGVAI --- LGDILSDG-NLAEYYRNALENWQQPVGSDFDQDSWENSKTSVLG
                                                                                                                                                                                                                                                                       185 AV---TRKGYPL-----AKLGNTRAAVNPDTATVDLNVVVDSGRPIAFGDFEITGTRRY
                                                                                                                                                                                                                                                                                                                        SVPVGTTGNFPIDNVVYPSYFGTTVAQTGSPSSS-----STPPFVKGDFPV----Y
                                                                                                                                                                                                                                                                                                                                                                                                                        332 VD-----LAASSSVTINSLRNAITLQOWFEKSARYGSRYVESVOGHFGVHLGDYRAORPI
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               SIMILARITY: BELONGS TO THE THIOL-ACTIVATED CYTOLYSIN FAMILY
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Streptococcus canis.
Bacteria; Firmicutes; Lactobacillales; Streptococcaceae;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               15-UUL-1998 (Rel. 36, Created)
15-UUL-1998 (Rel. 36, Last sequence update)
15-UUL-1998 (Rel. 36, Last annotation update)
Streptolysin O precursor (Thiol-activated cytolysin).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             DARLG-AEFLAEGRKIPGSDIDLGNSHATMLTASW 425
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            DVPFGYQERYAEYRYKPSKVTGLFRSNATGTLDSW 535
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           AA.
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                                                                                                                                                                                                                                                                                                                                                                                                                                                  -SVLGAVTRKGYPLA-KLGNTRAAVNPDTATVDLNVVVDSGRPIAFGDFEITGTQRYPEQ 238
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    253
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            I-----VSGLARFQPGTPYDLDLLLDFQQALEQ-NGHYSGASVQADFDRLQGDRVPVKV 291
                                                                                                                                                                                                                                                                                              65 KDMVEEHLPLITQQQEEVLDKEQTGFLAEEAPDNVKTMLRSKGYFSSKVSLTEKDGAYTV 124
                                                                                                                                                                                Gaps
                                                                                                                                                                                                                                                        LLTAALIVGNLVTANADSNKONTANTETTTTNEOPKPESSELTTEKAGOKMDDMLNSNDM 78
                                                                                                                                                                                                                  LLLPALFFFPHAYAPAADLSENKAAGFALFKNKSPDTESVKL-KPKFPVRID--TQDSEI 64
                      Signal.
BY SIMILARITY.
STREMULARITY.
BINDING TO CHOLESTEROL (BY SIMILARITY).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Bovine adenovirus type 3 (Mastadenovirus bos3).
Viruses; dsDNA viruses, no RNA stage; Adenoviridae; Mastadenovirus.
NCBI_TaxID=10510;
                                                                                                                                                                                                                                                                                                                                    79 IKLAPKEMPLESAEKEE-KKSEDNKKSEEDHTEEINDKIYSLNY--NELEVLAKNGETIE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                125 HITPGPRTKIANVGVAILGDILSDGNLAEYYRNALENWQQPVGSDFDQDSWENSKT---
                                                                                                                                                                                                                                                                                                                                                                                                                -----ERKKKNINTTPVD
                                                                                                                                                                                                                                                                                                                                                                                                                                                                        205 IHIDLPGMGDKATVEVNDPTYANVSTAIDNLVNQWHDNYSG------GNTLPART
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        SVTE---VKRHKLETGIRLDSEYGLGGKIAYDYYNLFNKG------YIGSV--
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          222;
                                                                                                                                      Length 574;
                                                                                                                                    3.5%; Score 111; DB 1; Length 574
18.6%; Pred. No. 7;
Live 89; Mismatches 228; Indels
                                                                                                  C84D2036908329AF CRC64;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            (Rel. 37, Created)
(Rel. 30, Last sequence update)
(Rel. 37, Last annotation update)
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PROSITE; PS00481; THIOL_CYTOLXSINS; 1.
TOXIn; Hemolysis; Cytolysis; Signal.
SIGNAL 1 36 BY SIMILAR
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                                                                              533
63911 MW;
                                                                                                                                                          Best Local Similarity 18.6
Matches 123; Conservative
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533 5
574 AA;
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15-DEC-1998
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IR 527
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Q03553;
                                                                              ACT_SITE
SEQUENCE
                                                                                                                                        Query Match
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Lee J.B.,
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Reddy P.S., Idamakanti N., Zakhartchouk A.N., Baxi M.K., Lee J.B. Pyne C., Babiuk L.A., Tikoo S.K.; "Nucleotide sequence, genome organization, and transcription map
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     THE LIGAND
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                           Mittal S.K., Prevec L., Babluk L.A., Graham F.L.;
"Sequence analysis of bovine adenovirus type 3 early region 3 if libre protein genes";
J. Gen. Virol. 73:3295-3300(1992).
                                                                                                                                                                                                                                           Mittal S.K., Prevec L., Babluk L.A., Graham F.L.;
"Sequence analysis of bovine adenovirus type 3 early region 3
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       bovine adenovirus type 3.";
J. Virol. 72:1394-1402(1998).
-1- FUNCTION: RECOGNIZES THE CELL RECEPTOR; SERVES AS THE LIGHT BETWEEN THE ADENOVIRUS CAPSID AND THE HOST CELL RECEPTOR
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Pred. No. 15;
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Interpro: IPR000998; Adeno_fiber_knob.
Interpro: IPR000931; Adeno_fiber_knob.
Pfam; PF00041, adeno_fiber; 1.
Pfam; PF000608; adeno_fiber; 1.
Pfam; PF000608; adeno_fiber2; 16.
PRINTS; PR00307; ADENOVSFIBRE.
                                                                                                                                                                                                                                                                                                   fibre protein genes.";
J. Gen. Virol. 74:2825-2825(1993).
MEDLINE-93107871; PubMed-1469367;
                                                                                                                                                                                                            MEDLINE=94103794; PubMed=8277294;
                                                                                                                                                                                                                                                                                                                                                                                                                                                 MEDLINE-98105785; PubMed-9445040;
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SEQUENCE 97
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161 NWQQPVGSDFDQDSWENSKTSVLGAVTRKGYPLAKLGNT----RAAVNPDTATVDLNVV 215
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01-MAY-1991 (Rel. 18, Last sequence update)
01-NOV-1995 (Rel. 32, Last annotation update)
Outer membrane usher protein mrkC precursor.
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InterPro: IPR000015; Fimb_usher.
Pfam: PF00577; Usher: 1.
PROSITE; PS01151; FIMBRIAL_USHER; 1.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             MEDLINE-91100388; PubMed-1670938;
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the European Bioinformatics Institute. There are no restrictions on its
use by non-profit institutions as long as its content is in no way
modified and this statement is not removed. Usage by and for commercial
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MEDLINE=94316500; PubMed=8041620;
Sofia H.J., Burland V., Daniels D.L., Plunkett G. III, Blattner F.R.;
"Analysis of the Escherichia coli genome. V. DNA sequence of the
region from 76.0 to 81.5 minutes.";
Nucleic Acids Res. 22:2576-2586(1994).
                                                                                                                 HATMLTASWKRQLLNNVLHPENGHYLDGKIGTTLGTFLSSTALIRTSARAGYFFTPENKK 476
                                                                                                                                                                          LGTFIIRGOAGYTV-ARDN---ADVPSGLMFRSGGASSVRGYELDSIGLAGPNGSVLP-- 530
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316 KIAYDYYNLFN-KG-YIGSVVWDMDKYETTLAAGISQPRNYRGNYWTSNVSYNRSTTQNL 373
                          366 RVANGQVQIFSGRGTAIGT-----DSSLTLNIRAPLQFSGPALTASLQGSGPITYNS 417
                                                                                                                                                                                                      LTDTVIRPNLGDGLEVRDNKIIVKLGANLRFENGAVTA------GTVNPSAPEAPPT 576
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     STRAIN=K12 / MG1655;
MEDLINE=97426617; PubMed=9278503;
Blattner F.R., Plunkett G. III, Bloch C.A., Perna N.T., Burland V., Riley M., Collado-Vides J., Glasner J.D., Rode C.K., Mayhew G.F., Gregor J., Davis N.W., Kirkpatrick H.A., Goeden M.A., Rose D.J., Mau B., Shao Y.;
                                                                                                                                                                                                                                     ---ERALLVGSLEYQLPFTRTLSGAVFHD------MGDA-AANFKRMKLKHGSGLGVR 578
                                                                                                                                                                                                                                                      577 LTAEPPLRASNSHLQLSLS---EGLVVHNNALALQLGDGMEVNQHGLTLRVGSGLQMR 631
                                                                           NNGTFGLSIGPGMWVDQNRLQVNPGAGLVFQGNNLVPNLADPLAISDSKISLSLGPGLTO
                                                       374 EKRAF----SGIWYVRDRAGIDARLGAEF-----LAEGRKIPGSDIDLG----NS
                                                                                                                                            478 ASNALTLS-----LGNGLEFSN-QAVAIKAGRGL-RFESSSQALESSLTVGNGLT----
                                                                                                                                                                                                                                                                                                                                                                                                                                                        Bacteria; Proteobacteria; gamma subdivision; Enterobacteriaceae;
Escherichia.
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                DB 1; Length 691;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            "The complete genome sequence of Escherichia coli K-12."; Science 277:1453-1474(1997).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         EMBL: AE000429; AAC76549.1; -.
EcoGene: EG1221; yhlg.
Hypothetical protein; Transmembrane; Complete proteome.
TRANSMEM 12 32 POTENTIAL.
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20.0%; Pred. No. 9.8;
tive 53; Mismatches 143;
                                                                                                                                                                                                                                                                                                                                      THJG_ECOLI STANDARD; PRT; 691 AA. P37645; P37644; 01-0CT-1994 (Rel. 30, Created) 15-JUL-1998 (Rel. 36, Last sequence update) 15-JUN-2002 (Rel. 41, Last annotation update) Hypothetical protein yhjG.
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Matches 96; Conservative
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144 NWTFNLANDDNKDA--NAKPSAWS-----FRLDNILFDOGRIAIDDKVSKADLEIF 192
                                                                                 VDS-GRPIAFGDFEITGTQRYPEQIVSGLARFQPGTPYDLDLLLDFQQALEQNGHYSGAS 274
                                                                                                                                                                                                                                                275 VQADFDRLQGDRVPVKVSVTEVKRHKLETGIRLDSEYGLGGKIAYDYYNLFNKGYIGSVV 334
                                                                                                                                                                                                                                                                                                                                                                                                               335 WDMDKYETTLAAGISQPRNYRGNYWTSNVSYNRSTTQNLEKRAFSGGIWYVRDRAGIDAR 394
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       374 LIGVDSGKGAEKSKRSEQKKGEKSVQPAGKV--------LPYDRFETDK--WDV 417
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         GDAAANFKRMKLKHGSGLGVRWFSP-----LAPFSFDIAYG-----HSDKK 598
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                                                                                                                                                                                                                                                                                                                                  233 ----EPLTG------TG------TG------KIGGMLA-----
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"Nucleotide sequence and functions of mrk determinants necessary
stression of type 3 fimbriae in Klebsiella pneumoniae.";
J. Bacteriol. 173:916-920(1991).
-!- FUNCTION: INVOLVED IN THE EXPORT AND ASSEMBLY OF THE TYPE 3
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Bacteria; Proteobacteria; gamma subdivision; Enterobacteriaceae;
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-:- SIMILARITY: BELONGS TO THE FIMBRIAL EXPORT USHER FAMILY.
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Penders J.E.C.;
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1392
458
867
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MOD_RES
SEQUENCE
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                                                                                                                                                          36;
                                                                                                                                                                                                                                                                                                                                                                                                                                                        578 ENRTANL-TSNTAFNNSR------FASSQIGVNGSLDSENNLNYGVSTTTAT 622
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          GRKIPGSDIDLGNSHATMLTASWKRQLLNNVLHPENGHYLDGKIGTTLGTFLSSTALIRT 462
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                                                                                                                                                                                                                                                                         103 -LRSKGYFSS-KVSLTEKDGAYTVHITPGPRTKIANVGVAILGDILSDGNLAEYYRNA-- 158
                                                                                                                                                                                                                                                                                                             DVYPSGYGSDLEVSVKEGDGSVEVFSVP-----YASVAQLLRPG-MTRYALSAGK 368
                                                                                                                                                                                                                                                                                                                                                                          202 AVNPDTATVDLNVVVDSGRPIAFGDFEITGTQRYPE---QIVSGLARFQPGTPYDLDLLL 258
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          DFQQALEQNGHY-SGASVQADFDRLQGDRVPVKVSVTEVKRHKLETGIRLDSEYGLGGKI 317
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       351
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           577
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            AHQHGVVFSPE-----TGPTMALIEAKDAAGVMLPGSPGTRIDSNGYAILPYL 711
                                                                                                                                                          Gaps
                                                                                                                                                                                                                                                                                                                                                      ----LEN------WQQPVGSDF----DQDSWENSKTSVLGAVTRKGYPLAKLGNTRA 201
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                GRO---HDVALNGSYRTPWTTL-----NGSYSOGEGYROSGVGASGTLI---
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               474 DALYAVDQEKNYNSNYTVWRQ------KNGMTFTVNQNLPDGW---GGFYLCGRV
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         520 A-DYWNRSGTEKOYOFSYNNMY-GRLSWSVDAQRVYTPDSSGHRRDDRVSLNFSYPLWFG
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                                        PROTEIN MRKC.
                                                                                                                                    ; Pred. No. 14;
84; Mismatches 213; Indels 216;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 (Exo-beta-D-
                                                                                                                Length 828;
Transmembrane; Fimbria; Transport; Signal.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Lactobacillales; Streptococcaceae;
                                                      POTENTIAL.
B30EDF5798249FC9 CRC64;
                    POTENTIAL.
OUTER MEMBRANE USHER
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  01-NOV-1997 (Rel. 35, Created)
01-NOV-1997 (Rel. 35, Last sequence update)
15-JUN-2002 (Rel. 41, Last annotation update)
Fructan beta fructosidase precursor (EC 3.2.1.80)
fructosidase) (Fructanase).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   560 AAANFKRMKLKHGSGLGVRWFSPLAPFSFDIAYGHSDKKI 599
                                                                                                                  DB 1;
                                                                                                                                                                                             VRIDTQDSEIKDMVEEHLPLITQQQEEVLDKEQTGFLA---
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                                                                                                                  Score 110;
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MEDLINE=93014178; PubMed=1398976;
                      18
828
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827
91049 MW;
                                                                                                            3.5%;
                                                                                                                                                    Matches 127; Conservative
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Bacteria; Firmicutes;
                                    19 8
813 8
828 AA;
                                                                                                                                    Similarity
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    Outer membrane;
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Q03174:
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This SWISS-PROT entry is copyright. It is produced through a collaboration between the Swiss Institute of Bioinformatics and the EMBL outstation-the European Bioinformatics Institute. There are no restrictions on its use by non-profit institutions as long as its content is in no way modified and this statement is not removed. Usage by and for commercial entities requires a license agreement (See http://www.isb-sib.ch/announce/or send an email to license@isb-sib.ch).
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  113 VSLTEKDGAYTVHITPGPRTKIANVGVAILGDILSDGNLAEYYRNALENWQOPVGSDFDQ 172
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      304
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              NTRAAVNPOTATVDLNVVVDSGRPIAFGDFEITGTQRYPEQIVSGLARFQPGTPYDLDLL 257
                                                                                                                                             EXTRACELLULAR INVERTASE.
-!- CATALYTIC ACTIVITY: Hydrolysis of terminal-non-reducing 2,1- and 2,6-linked beta-b-fructofuranose residues in fructans.
-!- SUBCELULAR LOCATION: Attached to the cell wall peptidoglycan by an amide bond (Potential).
-!- INDUCTION: BY SUCROSE, FRUCTAN SUBSTRATES AND FRUCTOSE.
-!- SIMILARITY: BELONGS TO FAMILY 32 OF GLYCOSYL HYDROLASES.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   LPXTG SORTING SIGNAL (POTENTIAL).
AMIDE-LINKED TO CELL WALL (POTENTIAL).
W; 8E574715F4E72A8A CRC64;
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---PEAVGASIIVEGGKAQADISVYQMKTIWTDKKDTAKPVAMNTTTAKELALQVGQTQD
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            FRUCTAN BETA-FRUCTOSIDASE.
REMOVED BY SORTASE (POTENTIAL).
BY SIMILARITY.
INVOLVED IN BINDING OF SUGARS WITH
BETA-(2,6) LINKAGES OR BINDING OF
MOLECULAR WEIGHT FRUCTANS (BY
SIMILARITY).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   258 LDFQQALEQNGHYSGASVQADFDRLQGDRV------PVKVSVTEVKRHKLETG----
                   exo-beta-D-fructosidase.";
Infect. Immun. 60:4621-4632(1992).
-!- FUNCTION: THIS PROFEIN IS A FRUCTANASE ENZYME WHICH DEGRADES
LEVANS AND INULINS TO FRUCTOSE AND ALSO CLEAVES SUCROSE INTO
GLUCOSE AND FRUCTOSE AND CAN THEREFORE FUNCTION AS AN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Score 110; DB 1; Length 1423;
Pred. No. 29;
7; Mismatches 160; Indels 140;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            : | | | ::||:: || SOHVTKNAD-GSIDLHIYVDRASVEVFS------KNNTVAGANQIFPN-----
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20.0%; Pred
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1391 1391 AMII
1423 AA; 158668 MW;
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458
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236

430 412

384

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                                                                                                                                     123 TVHITPGPRTKIANVGVAILGDILSDGNLAEYYRNALENWQQPVGSDFDQDSWENSKT-- 180
                                                                                                                                                                                                                                                                                                                                                        161 VDISIIDSVTDRTYPAALQLANKGFTENKPDAVV------TKRNP 199
                                                                                                                                                                                                                                                                                                                                                                                                            EQI-----VSGLARFQPGTPYDLDLLLDFQQALEQ-NGHYSGASVQADFDRLQGDRVPV 289
                                                                                                                                                                                                                                                                                                                                                                                                                                            200 QKIHIDLPGMGDKATVEVNDPTYANVSTAIDNLVNQWHDNYSG------GNTLPA 248
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |:| : |:| : |:| : |:| 307 NLPNNPADVFDKSVTFKELQRKGVS---NEAPPLFVSNVAYGRTVFVKLETSSKSNDV-- 361
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   431 NNVLHPENGHYLDGKIGTTLGTFLSSTALIRTSARAGYFFTPENKKLGTFIIRGQAGYTV 490
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       491 ARDNADVPSGLMFRSGGASSVRGYEL--DSIGLAGPNGSVLPERALLVGSLEYQLPFTRT 548
                                                                                                                                                                                                                                                      -----ERKKKNINTTP 160
                                                                                                      68 VE---EHLPLITQQQEEVL--DKEQTGFLAEEAPDNVKTMLRSKGYFSSKVSLTEKDGAY 122
                                                    LLTAALIIGNLVTANAESNKONTASTETTTTNEQPKPESSELTTEKAGGKTDDMLNSNDM 75
                                                                                                                                                                                                                                                                                                      ---SVLGAVTRKGYPLA-KLGNTRAAVNPDTATVDLNVVVDSGRPIAFGDFEITGTQRYP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             290 KVSVTE---VKRHKLETGIRLDSEYGLGGKIAYDYYNLFNKG-----YIGSV
     8 LLLPALFFFPHAYAPAADLSENKAAGFALFKNKSPDTESVKLKPKFPVRIDTQDSEIKDM
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 -----VWDMD-KYETTLAAGISQPRNYRGNYWTSNVSYNRSTTQNLEKRAFSGGIWY
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     413 RNVI-----KDNATFSRKNPAYPISYTSV----FLKNNKIAG---VNNRTEY-V
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      549 LSGAVFHDMGDAAANFKRMKLKHGSGLGVRWFSPLAPFSFDIAYGHSDKKIR
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Submitted (JUN-1993) to the EMBL/GenBank/DDBJ databases
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                01-FEB-1994 (Rel. 28, Created)
01-FEB-1994 (Rel. 28, Last sequence update)
01-RVV-1995 (Rel. 32, Last annotation update)
Hemolysin activator-like protein FHAC precursor.
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                                                                                                                                                                                                                                                      131 IENFVPKEGVKKADKFIVI-----
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Bordetella pertussis,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         SEQUENCE FROM N.A.
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P35077:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Bordetella.
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SDIDLGNSHATMLTASWKRQLLNNVLHPENGHYLDGKIGTTLGTFLSSTALIRTSARAGY 468
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D05AA9979DCBCABO CRC64;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Kehoe M.A., Miller L., Walker J.A., Boulnois G.J.;
*Nucleotide sequence of the streptolysin O (SLO) gene: structural
homologies between SLO and other membrane-damaging, thiol-activated
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  SIMILARITY: BELONGS TO THE THIOL-ACTIVATED CYTOLYSIN FAMILY.
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; Pred. No. 9.4;
92; Mismatches 234; Indels 202;
                                                                                                                                                                                                                                                                                                                                                                                                                                                         Streptococcus pyogenes.
Bacteria; Firmicutes; Lactobacillales; Streptococcaceae;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   ProDom; PD007062; Thiol_cytolysin; 1, PROSITE; PS00481; THIOL_CYTOLYSINS; 1. TOXin; Hemolysis; Cytolysis; Signal; Complete proteome.
                                                                                                                                                                                                                                                                                                                                                     01-FEB-1991 (Rel. 17, Last sequence update)
16-027-2001 (Rel. 40, Last annotation update)
Streptolysin O precursor (Thiol-activated cytolysin).
SLO OR SPYO167.
                                                                                                                                                                                                                                                                              571 AA.
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 STRAIN-SF370 / ATCC 700294 / Serotype M1;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     INTERPROFICE THOUSEN THIOL CYTOLYSIN. Pfam; PF01289; Thiol Cytolysin; 1. PRINTS; PR01400; TACYTOLYSIN.
                                               1057 YDIDL-----KYQRGLIN-----
                                                                                                                                                   1087 FGDSETVRLYRF----AGDTIAEAN 1107
                                                                                                 FFTPENKKLGTFIIRGQAGYTVARDN 494
                                                                                                                                                                                                                                                                              PRT;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            MEDLINE-88057628; PubMed-3502717;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Infect. Immun. 55:3228-3232(1987)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           EMBL; AE006485; AAK33267.1; -. PIR; A43507; A43507 HSSP; P19995; 1PFO.
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Matches 124; Conservative
                                                                                                                                                                                                                                                                              STANDARD;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           EMBL; M18638; AAA26975.
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530 5
571 AA;
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ACT_SITE
SEQUENCE
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                                                                                                                                                                                                                                                                                                                                                                                                                                                  423
                                                                                                                                                                                                                                                                                                                                                                                                                                                                           388
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    : | :: | :: | | : | GMQYSTQRGA----NAYEGDLSFTRGVGNNGKYAAYDERGPQGNVSRFNGSLAWTRYMA 444
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        518
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                                                                                                                                                                                   EVLDKEQTGFLAEEAPDNVKTMLRSKGYFSSKVSLTEK---DGAYTVHITPGPRTKIANV 137
                                                                                                                                                                                                                                     138 GVAILGDILSDGNLAEYYR----NALENWQQPVGSDFDQDSWENSKTSVLGAVTRKGY 191
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     464
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                                                                                                          Gaps
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STRAIN=El Tor N16961 / Serotype Ol;
MEDLINE=20406833; PubMed=10952301;
Heidelberg J.F., Elsen J.A., Nelson W.C., Clayton R.A., Gwinn M.L.,
                                                                                                                                 PAADLS-ENKAAGFALFKNKSPDTESVKLKPKFPVRIDTQDSEIKDMVEEHLPLITQQQE
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                                                                                                                                                                                                     -----QAIYNINNGGKTGNITIVPADEYGYSYLDLQLQRRALPRVSLGMDNSGPGTP
                                                                                                                                                                                                                                                                                                                                          252 YOLDLILDFQQALEQNGHYS-GASVQADFDRLQGDRVPVKVSVTEVKRHKLETGIRLDSE
                                                                                                                                                                                                                                                                                                                                                                    -------ENGRYKYNASVTAN------DLLGLNDTL-------GLYIGNR
                                                                                                                                                                                                                                                                                                                                                                                              YGL-GGKIAYDYYNLFNKGYIGSVVWDMDKYETTLAAGISQPRNY----RGNYWT--SNV
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    424 SWKRQLLNNVLHPENGHYLD------GKIGT-----TLGTFLSSTALIRTSA
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  493 GVYLSNTLTVPVQFSLLGKQASVAPFVGADVGALKSNHPDARTIRMA...----
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Is-Jun-2002 (Rel. 41, Last Sequence update)
Carbamoyl-phosphate synthase large chain (EC 6.3.5.5) (Carbamoyl-phosphate synthase large chain (EC 6.3.5.5) (Carbamoyl-brosphate synthetase ammonia chain).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Bacteria; Proteobacteria; gamma subdivision; Vibrionaceae; Vibrio
                                                                                                        186;
                                        HEMOLYSIN ACTIVATOR-LIKE PROTEIN 8E625B2C07702178 CRC64;
                                                                             Length 584;
                                                                                                        Indels
                                                                                            pred. No. 9.7;
71; Mismatches 238;
                                                                              DB 1;
                                                                                         9.7;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     1076 AA.
                                                                              3.4%; Score 109; 20.5%; Pred. No. 9
                           POTENTIAL.
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                         30 PC
584 HE
6445 MW;
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                                                                                         Best Local Similarity 20.5
Matches 128; Conservative
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                           31 E
584 AA;
M19.UNW;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Vibrio cholerae.
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Q9KPH9;
MEROPS; P
                                                     SEQUENCE
                                                                              Query Match
                           IGNAL
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                31;
Dodson R.J., Haft D.H., Hickey E.K., Peterson J.D., Umayam L.A., Gill S.R., Nelson K.E., Read T.D., Tettelin H., Richardson D., Ermolaeva M.D., Vamathevan J., Bass S., Qin H., Dragol I., Sellers P., McDonald L., Utterback T., Fleischmann R.D., Nierman W.C., White O., Salzberg S.L., Smith H.O., Colwell R.R., Mekalanos J.J., Venter J.C.,
                                                                                                 SEIKDMVEEHLPLITQQQEEVLDKEQTGFLAEEAP-DNVKTMLRSKG-----YF 109
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           110 SSKVSLT-EKDGAYTVHITPGPRTKIANVGVA-----ILGDILS------DGNLAE 153
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       61
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             ATP (POTENTIAL).

ATP (POTENTIAL).

MANGANESE 1 (BY SIMILARITY).

MANGANESE 2 (BY SIMILARITY).

MANGANESE 2 (BY SIMILARITY).

MANGANESE 3 (BY SIMILARITY).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    OLIGOMERIZATION DOMAIN.
CARBAMOYL PHOSPHATE SYNTHETIC DOMAIN.
ALLOSTERIC DOMAIN.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       AEFKS-----DTAYMYSTYDEE-----CEANPTDKDKIMVLGGGPNRIGQGIEFDYC
                                                                            sequence of both chromosomes of the cholera pathogen Vibrio
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             260; Indels 184;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Repeat;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   PROSITE; PS00866; CPSASE_1; 2.
PROSITE; PS00867; CPSASE_2; 2.
Arginine biosynthesis; Pyrimidine biosynthesis; Ligase;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Complete proteome.
CARBOXYPHOSPHATE SYNTHETIC
                                                                                                                                                                                                                         similarity).
SIMILARITY: BELONGS TO THE CARB FAMILY.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Mismatches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 23;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Pred. No.
                                                                                                                                                                                                                                                                                                                                                                                                   InterPro; IPR005483; CPase_L.
InterPro; IPR005489; CPase_L_D2.
InterPro; IPR005480; CPase_L_D3.
InterPro; IPR005481; CPase_L_D3.
InterPro; IPR004362; MGS_IIKe.
Pfam; PF00289; CPSase_L_Chaln; 2.
Pfam; PF02789; CPSase_L_D2; 2.
Pfam; PF02789; CPSase_L_D3; 1.
Pfam; PF02789; CPSase_L_D3; 1.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           117911 MW;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             80;
                                                                                                                                                                                                                                                                                                                                                                 EMBL; AE004309; AAF95532.1; -.
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        PRINTS; PR00098; CPSASE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          ATP-binding; Manganese;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                935
1076
553
1076
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295
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                                                                                                                                                                                                                                                                                                                                                                                HSSP; P00968; 1A9X.
TIGR; VC2389; -.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Similarity
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   153
303
285
299
301
828
840
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554
936
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Best Local Sim
Matches 138;
                                                                                         cholerae.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           SEQUENCE
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NP_BIND
NP_BIND
METAL
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METAL
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            DSEIKDMVEEHLPLITQQQEEVLDKEQTGFLAEEAPDNVKTMLRSKGYFSSKVSLTEKDG 120
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               275 VQADFDRLQGDRVPVKVSVTEVKRHKLETGI------RLDSE-----YGLGGK 316
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         441 PVKGQVWEVR-----LSDVLQS 483
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 -----TAFLENYMANSSTTTYRQTG-----EQQS 198
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     121 AYTVHITPGPRTKIANVGVAILGDILSDGNLAEYYRNALENWQQPVGSDFDQDSWENSKT 180
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  SHYVQLYPG----FNIG------AWRIRNA-TSWNQ---SGNSAGKWQSSYI 236
                                                                                                                                                                                                                                                                                                                                                                                           Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  SVLGAVTRKGYPLAKLGNTRAAVNPDTATVD-LNVVVDSGRPIAFGDFEITGTQRYPEQI
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              240 VSGLARFO-----ALEQNGHYSGAS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  317 IAYDYYNLFNKGYIGSVVWDMDKYETTLAAGISQPRNYRGNYWTSNVSYNRSTTQNLEKR
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            ENGHYLDGKIGTTLGTFLSSTALIRTSARAGYFFTPENKKLGTFIIRGQAGYTVARDNAD
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       484 YRRHDYSRR-----DWHSNSLRNQTHVVVG------OPLGQF----GYLNLNWSRQN--
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                -----SVKLKPKFPVRIDTQ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        ----YATRGLYRL----KSRVTLGOSYTPGDFFDSVPFSGVMLGDDDNMLPSSQRDFIPV
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            -----WNL--TAFVGG-QWSPHYQATTAGMGV-----MLGDYGALSSSITQATSEYRQQQ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         377 AFSGGIWYVRDRAGIDARLGAEFLAEGRKIPGSDIDLGNSHATMLTASWKRQLLNNVLHP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               497 VPSGLMFRSGGASSVRGYELDSIGLAGPNGSVLPERALLVGSLEYQLPFT-----R
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                                                                                                                                                                                                                                                                                                                                                                                     232; Indels 225;
                                                                                                                                                                                                                                 OUTER MEMBRANE USHER PROTEIN MYFC.
                                                                                                                      Pfam; PF00577; Usher; 1...

PROSTTE; PS01151; FIMBRIAL_USHER; 1.

Outer membrane; Transmembrane; Fimbria; Transport; Signal.

SIGNAL.
                                                                                                                                                                                                                                                                                                                                       DB 1; Length
                                                                                                                                                                                                                                                                                    B6D207F75161D0D0 CRC64;
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Last annotation update)
                                                                                                                                                                                                                                                                                                                               s; Score 108.5; D
s; Pred. No. 17;
82; Mismatches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             PRT; 1375 AA.
                                                                                                                                                                                                                                                                                                                                                                                                                                        16 FPHAYAPAADLSENKAA----GFALFKNKSPDTE----
or send an email to license@isb-s1b.ch)
                                                                                                                                                                                                                                                            POTENTIAL
                                                                                           InterPro; IPR000015; Fimb_usher.
                                                                                                                                                                                                                            27 841 OU
817 840 PC
841 AA; 93414 MW;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Created)
                                                                                                                                                                                                                                                                                                                                       3.4%;
                                                EMBL; 221953; CAA79953.1; -. PIR; S39365; S39365.
                                                                                                                                                                                                                                                                                                                                                                                     Matches 124; Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             STANDARD;
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P13470; P05427;
01-NOV-1988 (Rel. 09, C1
01-JAN-1990 (Rel. 13, Li
15-DEC-1998 (Rel. 37, Li
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 .___.DDGI
                                                                                                                                                                                                                                                                                                                                                             Similarity
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---LTEKDGAYTVHIT 127
 83 --LDKEQTGFL--AEEAPDNVKTMLRSKGYFSSKVS----
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             517 AA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         1328 VTGARVVNGHASILSLMVF 1346
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                562 ANFKRMKLKHGSGLGVRWF 580
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               STANDARD;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Mus musculus (Mouse).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            SEQUENCE FROM N.A.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         2) (HSTF 2).
HSF2.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             HSF2_MOUSE
                                                                                                                                                                    226
                                                                                                                                                                                                                                                                                                                                       363
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                                                        128
                                                                                                                                                                                                                                                    qq
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                                                                                                                                                                                                                                                 Shiroza T., Uedda S., Kuramitsu H.K.;

"Sequence analysis of the gifl gene from Streptococcus mutans.";

"Sequence analysis of the gifl gene from Streptococcus mutans.";

"Sequence analysis of the gifl gene from Streptococcus mutans.";

"J. Bacteriol. 169:4263-4270(1997).

"J. Bacteriol. 169:4263-4270(1997).

"J. BONCTION: PRODUCTION OF EXTRACELLULAR GLUCANS, THAT ARE THOUGHT

OF THEIR ABILITY TO ADHERE TO SMOOTH SURFACES AND MEDIATE THE

AGREGATION OF BACTERIAL GELLS AND FOOD DEBRIS.

"CATALITY CATALITY: Sucrose + {(1,6)-alpha-D-glucosyl}{(N+1)}.

"I SUBCELLULAR LOCATION: Secreted.

"I SUBCELLULAR LOCATION: Secreted.

"I SUBCELLULAR LOCATION: Secreted.

"I SUBCELLANEOUS: GTF-I SYNTHESIZES WATER-INSOLUBLE GLUCANS (ALPHA

"ATTER-SOLUBLE GLUCOSE AND SOME 1,6 LINKAGES), GTF-S SYNTHESIZES

WATER-SOLUBLE GLUCANS.

"SAUTHARATY: TO OTHER GLUCOSYLTRANSFERASES AND SOME TO A GLUCAN-
BINDING PROTEIN FROM S.MUTANS.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    This SWISS-PROT entry is copyright. It is produced through a collaboration between the Swiss Institute of Bioinformatics and the EMBL. outstation the Buropean Bioinformatics Institute. There are no restrictions on its use by non-profit institutions as long as its content is in no way modified and this statement is not removed. Usage by and for commercial entities requires a license agreement (See http://www.isb-sib.ch/announce/or send an email to license@lsb-sib.ch).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             34;
                                                                                                                                                     Ueda S., Shiroza T., Kurami'tsu H.K.; "Sequence analysis of the gtfC gene from Streptococcus mutans GS-5."; Gene 69:101-109(1988).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      30 KAAGFALFKNKSPDTESVKLKPKFPVRIDTQDSEIKDMVEEH-----LPLITQQQEEV-- 82
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Transferase; Glycosyltransferase; Signal; Repeat; Dental caries.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Indels 189;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             3.4%; Score 108.5; DB 1; Length 1375; 19.7%; Pred. No. 35;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       CATALYTIC (APPROXIMATE),
GLUCAN-BINDING (APPROXIMATE),
2.4 A, 1 C AND 1 AC REPEATS.
A REPEAT.
C REPEAT.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     D4B80CBEE0AACE13 CRC64;
                                                        Bacteria; Firmicutes; Lactobacillales; Streptococcaceae;
Glucosyltransferase-SI precursor (EC 2.4.1.5) (GTF-SI) (Dextransucrase) (Sucrose 6-glucosyltransferase).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            GLUCOSYLTRANSFERASE-SI,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        (INCOMPLETE)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            269;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Pred. No. 35;
87; Mismatches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          C REPEAT.
AC REPEAT.
A REPEAT (
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               EMBL; M17361; AAA88589.1; -.
PIR; JT0345; JT0345.
PIR; C33135; C33135; C3136; C310479; CM_Dinding.
InterPro; IPR002479; CM_Dinding.
Pfam; PF01473; CM_Dinding_1; 7.
Pfam; PF02324; Glyco_lydoi_20; 1.
                                                                                                                                                                                                                                      MEDLINE-87308013; PubMed-3040685;
                                                                                                                                        MEDLINE-89137980; Pubmed-2976010;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   1126 1375
1126 1375
1126 1159
1169 1200
1227 1238
1253 1303
1318 1303
1318 AA: 153022 M
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   EMBL; M22054; AAA88592.1; -.
                                                                                                                                                                                                             SEQUENCE OF 1-349 FROM N.A.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Matches 134; Conservative
                                          Streptococcus mutans
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Local Similarity
                                                                                                              SEQUENCE FROM N.A.
                                                                    Streptococcus.
NCBI_TaxID=1309;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     SEQUENCE
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1162 DNGNKVLSYYGNDGRRY-----ENGYYLFGOOWRYFONGIMAVGLTRVHGAVOYFDA 1213
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   1104 GYVYY--STSGNQAKNAFISLGNNWYYFDNNGYMVTGAQSINGANYYFLSNGIQLRNAIY 1161
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               1270 NGQRLYFKPNG--VQAKGEFIRDANGYLRYYDPNSGNEVRNRFVRNSKGEWFLFDHNGIA 1327
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         412 DLGNSHATMLTASWKRQLLNNVLHPENGHYLDGKIGTTLGTFLSSTALIRTSARAGYFFT 471
                                                     PGPRTKIANVGVAILGDILSDG-----NLAEYYRNA-----LENWQQPVGSDFDQDS 174
                                                                                           838 PSTDGKSVHONAALDSRVMFEGFSNFOAFATKKEEYTNVVIAKNVDKFAEWGVTDFEMAP 897
                                                                                                                                                                                                                                                                                                                      261 QQALEQNGHYSGA---SVQADFDRLQGDRVPVKVSVTEVKRHKLETGIRLDSEYGLGGKI 317
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         p38533,
01-0CT-1994 (Rel. 30, Last sequence update)
01-0CT-1994 (Rel. 40, Last sequence update)
Heat shock factor protein 2 (HSF 2) (Heat shock transcription factor
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Buteleostomi;
Mammalia; Eutheria; Rodentla; Sclurognathi; Muridae; Murinae; Mus.
NCBI_TaxID=10090;
778 YHSDQEAAGLVRYTNDRGELIFTAADIKGYANPQVSGYLGVWVPVGAAADQDVRVAASTA
                                                                                                                                                                                                         898 QYVSSTDGSFLDSVIQNGYAF-----TDRYDLGI----SKPNKYGTADDLVK
                                                                                                                                                                                                                                                                                   ------PDLDLLLDF
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 318 A--YDYYNLFNKGYIGSVVWDM--DKYETTLAAGISQPRN-YRGNYWTSN-----
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              --VSYNRSTTQNLEKRAF--SGGIWYVRDR----AGIDARLGAE--FLAEGRKIPGSDI
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      472 PENKKLGTFIIR--GQAGYTVARDNADVPSGLMFRSGGASSVRGYELDSIGLA-----
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       523 -----GPNGSVLPERALLV----GSLEYQLP------FTRTLSGAVF-HDMGDAA
                                                                                                                                                                  175 WENSKT--SVLGAVTRKGYPLAKLGNTRAAVNPDTATVDLNVVVDSGRPLAFG-----
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                                                                            This SWISS-PROT entry is copyright. It is produced through a collaboration between the Swiss Institute of Bioinformatics and the EMBL outstation-the European Bioinformatics Institute. There are no restrictions on its use by non-profit institutions as long as its content is in no way modified and this statement is not removed. Usage by and for commercial entities requires a license agreement (See http://www.isb-sib.ch/announce/or send an email to license@isb-sib.ch).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         13;
 SUBUNIT: DNA-BINDING HOMOTRIMER IN STRESSED OR HEAT SHOCKED CELLS,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | | : : | | : | | 343 MDSILNDNINLLGKV----ELLDYLDSIDCSLEDFQAMLSGRQFSIDPDLLVDSENKGLE 398
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    NSKTSVLGAVTRKG------YPLAKL--GNTRAAVNPDTATVDLNVVVDS 218
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   :|:||: |: :| |1 |1 |399 ATKSSVVQHVSEEGRKSKSKPDKQLIQYTAFPLLAFLDGNSASAIEQGSTTASSEVVPSV 458
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           -----QTGFLAEEAPDNVKT-------MLRSKGYFSSKVSLTEKDGAYTVHITPGPRT- 132
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               --KIANVGVAILGDILSDGNLAEYYRN---ALENWQQPVGS------DFDQDSWE 176
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          219 GRPIAFGDFEITGTQRYPEQIVSGLARFQPGT--------PYDLDL-LLD 259
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           233 TEGLKSRERISDDIIIYDVTDDNVDEENIPVIPETNEDVVVDSSNQYPDIVIVEDDNEDE 292
                        SUBCELLULAR LOCATION: CYTOPLASMIC DURING NORMAL GROWTH AND MOVES TO THE NUCLEUS UPON ACTIVATION.
SIMILARITY: BELONGS TO THE HSF FAMILY.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       91; Indels 100; Gaps
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Bacteria; Proteobacteria; epsilon subdivision; Campylobacter group;
                                                                                                                                                                                                                                           MGD: MGI:96239; HSf2.

MGI:96239; HSf2.

InterPor: IPR00232; HSf_DNA_bind.

InterPor: IPR00341; HSf_ETS.

PROMO PROUNTS; PR00156; HSFDOMAIN,

PRINTS; PR00156; HSFDOMAIN,

PROSTIE; PS00434; HSF_DNA_bind; 1.

PROSTIE; PS00434; HSF_DNA_NIN; 1.
                                                                                                                                                                                                                                                                                                                                                                                                                                                               Length 517;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                44 TESVKLKPKFPVRIDTQDSEIKDMVEEHLPLITQQQEEVL-------
                                                                                                                                                                                                                                                                                                                                                                                                        HR-A/B.
                                                                                                                                                                                                                                                                                                                                                                                                                                098965BBCDF4E1B0 CRC64;
               SIMILARITY
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HYDROPHOBIC REPEAT
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Last annotation update)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                          ; Pred. No. 9.4; 45; Mismatches
                                                                                                                                                                                                                                                                                                                                                                                                                                                            3.4%; Score 108;
21.3%; Pred. No. 9
              OTHERWISE FOUND AS A HOMODIMER (BY
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          PRT;
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046113: 001673;
16-027-2001 (Rel. 40, Created)
16-027-2001 (Rel. 40, Last sequinocut-2001 (Rel. 40, Last sequinocut-2001)
                                                                                                                                                                                                                                                                                                                                                                                                                   359 384 H
                                                                                                                                                                                            EMBL; X61754; CAA43893.1; -.
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                                                                                                                                                                                                           PIR; B40583; B40583.
                                                                                                                                                                                                                     2HTS.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Similarity
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SEQUENCE FROM N.A.
                                                                                                                                                                                                                      HSSP; P22121; 2HTS
TRANSFAC; T00972;
                                                                                                                                                                                                                                                                                                                                                                                                      119
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Best Local S:
Matches 64,
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FLA3_CAMJE
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           103 OSLKTRTMLQ-----ADINRLMEELDNIA-----NTTSFNGKQLLSG----- 139
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         GKIAYDYYNLFNKGYIGSVVWDMDK--YETTLAAGISQPRNYRGNYWTSNVSYNRSTTQN 372
STRAIN-ATCC 43431 / TGH 9011 / Serotype LI036;
Khawaja R., Neote K., Bingham H.L., Penner J.L., Chan V.L.;
"Cloning and sequence analysis of the flagellin gene of Campylobacter
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Gaps
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 198 ---ntraavnpdtatvdlnvvvdsgrpiafgdfeitgtgrypeqivsglarfqpgtpydl 254
                                                                                                                                                                                                                                                                              255 DLLLDFQQALEQNGHYSGASVQADFDRLQGDRVPVKVSVTEVKRHKLETGIRLDSEYGLG
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ProDom; PD000316; Flagellin_C; 1.
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InterPro; IPR001029; Flagellin_C.
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571
574 AA;
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Best Local Sim
Matches 104;
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P42790:
                 Hydrolase;
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Delepelaire P., Wandersman C.;
*Proteases secretion by Erwinia chrysanthemi. Proteases B and C are synthesized and secreted as zymogens without a signal peptide.*;
J. Blol. Chem. 264:9083-9089(1989).
-! CORCTOR: THE DIVAMENTS CATTONS MG(Z+) AND CA(Z+) INCREASE PROTEASE ACTIVITY SIGNIFICAMILY ABOVE THE CONTROL VALUE.
-! SUBCELLUIAR LOCATION: Secreted.
-! DAMAIN: THE GLY-RICH REPEATS MAY BE IMPORTANT IN THE EXTRACELLULAR SECRETION OF THIS METALLOPROTEASE.
-! SIMILARITY: BELONGS TO PEPTIDASE FAMILY MIOB.
                                            :: : : | | : | 332 VKNDGK-DILISGINLSAIGFGIGHMISQASVSLRESKGQIDANVADAMGFNSANKGNIL 390
 ---INSVKDTTGVEASIDENGKLLLTSREGRGIKIEGNIGR--GAFINPNMLENYGRLSL 331
                                                                                                          391 GGYSSVSAY-MSSTGSGFSSGS----GFSVGSGKNYSTGFANTIAISAASQLSAVYNVS 444
                                                                               GGASSVRGYELDSIGLAGPNGSVLPERALLVGS-LEYQLPFTRTLS------GAVFH--
                           460 IRTSARAGYFFTPENKK --- LGTFIIRGQAGYTVARD ----NADVPSGLMFRS-----
                                                                                                                                                                                                                                                                                                                                                                                                                                          Delepelaire P., Wandersman C.;
Protein secretion in Gram-negative bacteria. The extracellular
metalloprotease B from Erwinia chrysanthemi contains a C-terminal
secretion signal analogous to that of Escherichia coli alpha-
                                                                                                                                                                                                                                                                                                                                             Bacteria; Proteobacteria; gamma subdivision; Enterobacteriaceae;
                                                                                                                                                                                                                                                            01-AUG-1990 (Rel. 15, Created)
1-NOV-1991 (Rel. 20, Last sequence update)
01-OCT-1996 (Rel. 34, Last annotation update)
Secreted protease C precursor (EC 3.4.24.-) (ProC).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       OF 1-59 FROM N.A., AND PARTIAL SEQUENCE
                                                                                                                                                                                                                                  479 AA.
                                                                                                                                      556 ---- DMGDAAANFKRMKLKHGSGLGVR 578
                                                                                                                                                               445 AGSGFSSGSNLSOFATMKTSAGNTLGVK 472
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       InterPro; IPR001343; Hemlysn_Ca_bind.
InterPro; IPR00130; Zn_MTpeptdse.
Pfam. PF00353; hemolysinCabind; 3.
PRINTS; PR00313; CABNDNGRPT.
SWART; SM00235; ZnMc; 1.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Biol. Chem. 265:17118-17125(1990)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           PROSITE; PS00142; ZINC_PROTEASE; 1.
                                                                                                                                                                                                                                    PRT;
                                                                                                                                                                                                                                                                                                                                                                                                                            MEDLINE-91009140; PubMed-2211614;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                MEDLINE-89255387; PubMed-2722818;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          EMBL; M59229; AAA24860.1; -.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     EMBL; J04736; AAA24862.1; -. EMBL; M60395; AAA63638.1; -. PIR; A38307; A38307. HSSP; P23694; 1AFO.
                                                                                                                                                                                                                                    STANDARD;
                                                                                                                                                                                                                                                                                                                                Erwinia chrysanthemi
                                                                                                                                                                                                                                                                                                                                                                                     [1]
SEQUENCE FROM N.A.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          MEROPS; M10.054;
                                                                                                                                                                                                                                                                                                                                                          Pectobacterlum.
NCBI_TaxID=556;
                                                                                                                                                                                                                                 PRTC_ERWCH P16317;
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SEQUENCE
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          SDGNL-----AEY---YRNALENWQQPVGSDFDQDSWENSKTSVLGAVTRKGYPLAKL 196
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      142 --GNLDYGTQAYAYYPGNYQGAGSSWY----NYNQSNIRNPGSEEYGRQTF----THEI 190
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     256
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    313
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            274 NSNTDRDFYTATDSSKALIFS-VWD-----AGGTDTFDFSG-----YSNNQRI 315
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            372 NLEKRAFSGGIWYVRDRAGIDARLGAEFLAEGRKI-----PGSDIDLGNSHATMLTASW 425
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   316 NLNEGSFS------DVGGLKGNVS---IAHGVTIENAIGGSGNDILVGNSADNILQGG- 364
                                                                                                                                                                                                                                                                                                                                                                                                                                   Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       SEQUENCE FROM N.A., AND SEQUENCE OF 216-224.
MEDLINE=95014496; PubMed=7929375;
Oda K., Takahashi T., Tokuda Y., Shibano Y., Takahashi S.;
Cloning, nucleotide sequence, and expression of an isovaleryl pepstatin-insensitive carboxyl proteinase gene from Pseudomonas sp. 101.;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           197 GNTRAAVNPDTATVDLNVVDSGRPIAFGDFEITGTQRYPEQIVSGLARFQPGTPYDLDL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    257 LLDFQQALEQNGHYSGASVQAD----FDRLQGDRVPVKVSVTEVKRHKLETGIRLDSEYGL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               314 GCKIAYDYYNL--FNKGYIGSVVWDMDKYETTLAAGISQPRNYRGNYWTSNVSYNRSTTQ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        426 KRQLLNNVLHPENG-HYLDGKIGTTLGTFLSSTALIRTSARAGYFFTPENKK-----LG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               01-NOV-1995 (Rel. 32, Created)
1-NOV-1995 (Rel. 32, Last sequence update)
15-UNV-2002 (Rel. 41, Last annotation update)
15-UNV-2001 (Rel. 41, Last annotation update)
15-UNV-2002 (Rel. 41, Last annotation update)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     191 GHALGLAHPG----EYN--AGEGDP-SYND-AVYAEDSYQFSIMSYWGENETGADY----
                                                                                                                                                                                                                                                                                                                                                                                                                                 Indels 135;
                                                           SECRETED PROTEASE C.
ZINC (CATALYTIC) (BY SIMILARITY).
BY SIMILARITY.
ZINC (CATALYTIC) (BY SIMILARITY).
ZINC (CATALYTIC) (BY SIMILARITY).
S X REPEATS, GLY-RICH.
                                                                                                                                                                                                                                                                                                                                                                                  Length 479;
                 Metalloprotease; Zinc; Zymogen; Calcium; Repeat.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Pseudomonas sp. (strain 101) (Achromobacter parvulus T1)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | : | | : | | 111 | 418 AFRNEGQLSFVQDQFTGKGQEVMLQWDAANSITNLWLHEAGHSSV 462
                                                                                                                                                                                                                                                                                                                                  990ED8376725DF61 CRC64;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    479 TFIIRGOAGYT------VARDNADVPSGLMFRSGGASSV 511
                                                                                                                                                                                                                                                                                                                                                                             3.4%; Score 107.5; DB 1; 22.4%; Pred. No. 9.1; tive 58; Mismatches 168;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     587 AA
PROSITE; PS00330; HEMOLYSIN_CALCIUM; 1.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     PRT;
                                                                                                                                                                                                                                                                                                                                  51600 MW;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Proteobacteria.
                                                                                                                                                                                                                                                                                                                                                                                                                                   Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       STANDARD;
                                                                     479
188
188
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PCP.
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354
363
372
381
479 AA;
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NCBI_TaxID=33067;
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 34;
                                                                                                                                                             MEDLINE-99419069; pubMed-10488127;
Oyama H., Abe S.-I., UShiyama S., Takahashi S., Oda K.;
Identification of catalytic residues of pepstatin-insensitive
carboxyl proteinases from prokaryotes by site-directed mutagenesis.";
J. Biol. Chem. 274:27815-27822(1999).
-!- CATALYIIC ACTIVITY: Hydrolysis of the B chain of insulin at 13-
Glu-I-Ala-14, 15-Leu-I-Tyr-16 and 25-Phe-I-Tyr-26 and angiotensin
I at 4-Tyr-1-11e-5. A good synthetic substrate is Lys-Pro-Ile-Glu-
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     255
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            EVLDKEQTGFLAEEAPDNVKTMLRSKGYFSSKVSLTEKDGAYTVHITPGPRTKIANVGVA 140
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      102 KFLKRRQ--FLSQFAP-----TEAQVQAVVAHLRKNGFVNIHVVPN-RLLISADGSA 150
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 141 ILGDILSDGN--LAEYYRNALENWQQPVGSDFDQDSWENSKTSVLGA--VTRKGYPLAKL 196
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          151 --GAVKAAFNTPLVRYQLNGKAGYANTAPAQVPQDLGE-IVGSVLGLQNVTR-AHPMLKV 206
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     GNTRAAVNPDTAT-----VDLNVVVD-SGRPIA----FGDFEITGTQRYPEQIVSGLAR 245
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        -----TLØDLQQFFSANG-------LASVNTQTIQTG- 280
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    361
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 60 APLLELAAGETAHIVV----SLKLR-----DEAQLKQLAQAVNQPGNAQFG 101
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        21 APAADLSENKAAGFALFKNKSPDTESVKLKPKFPVRIDTQDSEIKDMVEEHLPLITQQQE 80
                                                                    Hara S.; "The primary structure of pepstatin-insensitive carboxyl proteinase
                                                                                                                                      MUTAGENESIS OF ASPARTIC ACID AND GLUTAMIC ACID RESIDUES, AND ACTIVE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Hydrolase; Protease; Serine protease; Zymogen; Periplasmic; Signal
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           246 FOPGTPYDLDLLLDFQQALEQNGHYSGASVQADFDRLQGDRVPVKVSVTEVKRHKLETGI
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 306 RLDSEYGLGGKIAYDYYNLFNKGYIGSVVWDMDKYETTLAAG--ISQPRNYRGNYWTS--
                                                     Hayashi K., Izu H., Oda K., Fukuhara K.-I., Matsuo M., Takano R.,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                238;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     DB 1; Length 587;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              69; Mismatches 226; Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  NUCLEOPHILE (BY SIMILARITY).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          61072 MW; E193D8B2C225829A CRC64;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               POTENTIAL.
REMOVED IN MATURE FORM.
PSEUDOMONAPEPSIN.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       REMOVED IN MATURE FORM.
                                                                                                                                                                                                                                                                      Phe-I-Phe(NO(2))-Arg-Leu.
SUBCELLULAR LOCATION: Periplasmic.
PTM: AUTOCATALYTICALLY PROCESSED.
SIMILARITY: BELONGS TO PEPTIDASE FAMILY S53.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Pred. No. 13;
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                                                                                               No. 101.";
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Biol. Chem. 269:26518-26524(1994).
                                         MEDLINE-96157710; PubMed-8576087;
                                                                                                           Biochem. 118:738-744(1995).
                                                                                                                                                                                                                                                                                                                                                                                                                                                      EMBL; D37970; BAA07188.1; -. MEROPS; S53.001; -.
                                                                                               produced by Pseudomonas sp.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Conservative
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502
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                          SEQUENCE OF 216-585.
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586
385
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543
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587 AA;
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les 137; Conserv
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ACT_SITE
ACT_SITE
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Matches
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                                                                327 TGLTQAFNQAVSDNVAK-VINVSLGWCEADANADGTLQAEDRIFATAAAQGQTFSVSSGD 385
                                                                                                                                       LGNSHATMLTASWKRQLLNNVLHPENGHYLDGKI------GTTLGTFLSS 456
                                                                                                                                                                                                       EG------VYECNNRGYPDGSTYSVSWPASSPNVIAVGGTTLYT---- 423
                                                                                                                                                                                                                                                                                                                                           ----TSAGA-----YES 457
                                                                                                                                                                                                                                                                                                                                                                                                                   551
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       518 ANSNSLGFPAASFYSAISSTPSLVHDVKSGNNGYGGYGYNAGTGWDYPTGWGSLDIAKLS 577
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Li Y., Valaitis A.P., Latshaw S.P., Kwiatkowska D., Tripathi R.L., Campbell M.C., Kemp R.G.;
"Structure and expression of the cDNA for the C isozyme of
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   01-FEB-1996 (Rel. 33, Created)
01-FEB-1996 (Rel. 33, Last sequence update)
16-OCT-2001 (Rel. 40, Last annotation update)
6-phosphofructokinase, type C (EC 2.7.1.11) (Phosphofructokinase
1) (Phosphohexokinase) (Phosphofructo-1-kinase isozyme C) (PFK-C).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                               158 KPSWQSVVSGTPGRRLLPDISFDAAQGTGALIYNYGQLQQIGGTSLASPIFVGLWARLQS
                                                                                                                                                                                                                                                                           457 TALIRTSARAGYFFTPENKKLGTFIIRGQAGYTVARDNADVPSGLMFRSGGASSVRGYE-
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       AVFHDMGDAAANF----KRMKLKH-----GSGLGVRWFSPLAPFSFDIA---
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Euteleostomi;
Mammalia; Eutheria; Lagomorpha; Leporidae; Oryctolagus.
                                                                                                                                                                                                                                                                                                                                                                                                           ---LDSIGLAGPNGSVLP----ERALLVGSLEYQLPFTRTLSG-----
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      phosphofructo-1-kinase from rabbit brain.";
J. Biol. Chem. 269:5781-5787(1994).
-!- CATALYTIC ACTIVITY: ATP + D-fructose 6-phosphate = ADP +
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PRINKTS: PR00476; PFKKINASE;
ProDom; PD000707; Ppfruckinase; 2.
PROSITE; PS00433; PHOSPHOFRUCTOKINASE;
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InterPro; IPR000023; Ppfruckinase.
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                                                                                                                             Gaps
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                                                                                                                                                                                                                                                                                                                                         AVTRKGYPLAKLGNTRAAVNPDTATVDLNVVVDSGRPIAFGDFEITGTQRYPEQIVSGLA
                                                                                                                                                                                                                                                                                                                                                                                   293 -VTQLGY----FDRILASRMGVEAVLILGHVQRGGTPSA---FDRILASRMGVEAVLALL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                    EATPETPACVVSLSGNHAVRLPLVECVQMTQEVQKAMDERRFKDAVQLRGRSFENNLNTY
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"Nucleotide sequence of the afimbrial-adhesin-encoding afa-3 gene
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Escherichia.
NCBI_TaxID=562;
                                                                                                                             164;
  Glycolysis; Repeat; Allosteric enzyme;
                                                                                   Length 791;
                                                                                                                           265; Indels
                   Phosphorylation; Magnesium; Multigene family.
SEQUENCE 791 AA: 86349 MW; 3C10A36F229FD8E8 CRC64;
                                                                                   DB 1;
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, Last annotation update)
protein afaC precursor.
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                                                                                 Similarity 18,9%; Pred. No. 20; 8; Conservative 77; Mismatches
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01-OCT-1996 (Rel. 34, Last seq
16-OCT-2001 (Rel. 40, Last anno
                                                                                                                             Matches 118; Conservative
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Kinase; Transferase;
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Escherichia coli.
Plasmid piri055.
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P53517;
                                                                                   Query Match
                                                                                                          Best Local
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This SWISS-PROT entry is copyright. It is produced through a collaboration between the Swiss Institute of Bioinformatics and the EMBL outstation the Buropean Bioinformatics Institute. There are no restrictions on its use by non-profit institutions as long as its content is in no way modified and this statement is not removed. Usage by and for commercial entities requires a license agreement (See http://www.lsb-slb.ch/announce/or send an email to license@isb-slb.ch).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 38;
                    J. Bacteriol. 176:7601-7613(1994).
-!- FUNCITON: INVOLVED IN THE EXPORT AND ASSEMBLY OF AFA-III AFIMBRIAL ADHESIN SUBUNITS ACROSS THE OUTER MEMBRANE.
-!- SUBCELLULAR LOCATION: Integral membrane protein. Outer membrane
translocation via flanking IS1 insertion sequences.";
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          57 IDTQDSEIKDMVEEHLPLI-----TQQQEEVLDKEQTGFLAEEAPDNVKTMLRSKGYFS- 110
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                                                                                                                                                               -!- SIMILARITY: BELONGS TO THE FIMBRIAL EXPORT USHER FAMILY.
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Interpro; IPR000015; Fimb_usher.
Pfam; PF00577; Usher; 1.
Pfam; PF00577; Usher; 1.
Outer membrane; Transmembrane; Fimbria; Transport; Signal; Plasmid.
SIGNAL POTENTIAL.
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      723 LAGY-ASPYQENVLTL-----DPTTFPEDAEVPQTDSRVVPTKGAVVRAGFRTRVGGRA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   LDSIGLAGPNGSVLP-----ERALLVGSLEYQLPFTRTLSGAVFHDMGDAAANFKR
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    YRNALENWOOPVGSDFDQDSWENSKTSVLGAVTRK-GYP--LAKLGNTRAAVNPDTATVD
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              QPGTPYDLDLLLDFQQALEQ----NGHYSGASVQADFDRLQGDRVPVKVSVTEVKRHKLET
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              GNY-----RAFSGG
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 LYWDVRE-----QMVPGSE----SHADTSRLNLTWYGTYGELTGMYSY
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         3.4%; Score 107; DB 1; Length 859;
20.1%; Pred. No. 22;
Live 79; Mismatches 189; Indels 270;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       OUTER MEMBRANE USHER PROTEIN AFAC
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      LGWSLGRLGAVSLDTTHSRGOOKGHDYETGDTWRIRYNKSFELTGT----
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    93805 MW; 1FF7FE3715EEFB93 CRC64;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  EMBL; X76688; CAA54117.1; -.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Best Local Similarity 20.1% Matches 135; Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          859
                                                                                                                                          (By similarity).
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           17;
                                                                                                                                                                                                                                                                                                                                                                                              'Pyrococcus abyssi genome sequence: insights into archaeal chromosome
                                                                                                                                                                                                                                                                                                                                                                                                                structure and evolution.";
Submitted (JUL-1999) to the EMBL/GenBank/DDBJ databases.
-1- FUNCTION: CATALYZES THE EXCHANGE OF INITIATION FACTOR 2-BOUND GDP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             HITPGPRTKIANVGVAILGDIL----SDGNLAEYYRNALENWQQPVGSDFDQDSWENSKT 180
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | :| | :| | :| | HCNAG---SLATVHLGTVGAVVRVMHKDGSLKLLMIDE----TRPVLQGARLSAWEYS-- 216
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 SVLGAVTRKGYPLAKIGNTRAAVNPDTATVDLNVVVDSGRPIAFGDFEITGTQRYPEQIV 240
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             VEEHLPLITQQQEEVLDKEQTGFLAEE---APDNVKTMLRSKGYFSSKVSLTEKDGAYTV 124
                                                                                                                                                                                                                                                                              Archaea; Euryarchaeota; Thermococci; Thermococcales; Thermococcaceae;
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                                                                                                                                                    16-00T-2001 (Rel. 40, Created)
16-0CT-2001 (Rel. 40, Last sequence update)
16-0CT-2001 (Rel. 40, Last annotation update)
Putative translation initiation factor eIF-2B subunit 1 (eIF-2B
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    -1- SUBUNIT: COMPLEX OF TWO DIFFERENT SUBUNITS (POTENTIAL).
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TIGREMB; TIGRO0512; alf.2Bl_fam; 1.
TIGREMB; TIGRO054; elf-2Bl_rel; 1.
Hypothetical protein; Initiation factor; Protein biosynthesis;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     3.4%; Score 106.5; DB 1; Length 356; llarity 23.6%; Pred. No. 7; Conservative 49; Mismatches 120; Indels 77.
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356 AA; 39548 MW; 4273C0A06C5B7513 CRC64;
                                                                                                                       356 AA.
                                                                                                                         PRT;
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InterPro; IPR005251; AIF-2BI_fam.
InterPro; IPR000649; IF-2B.
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                                                                                                                                                                                                                          GDP-GTP exchange factor). AIF-2BI OR PAB2444.
                                                                                                                       STANDARD;
567 MKLKHGSGLGVRW 579
                                 819 -GLKESGKLKAQW 830
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es 76; Conserv
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SEQUENCE 356 AA
                                                                                                                                                                                                                                                            Pyrococcus abyssi
                                                                                                                                                                                                                                                                                                              NCBI_TaxID=29292;
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                                                                                                                      E2B1_PYRAB
Q9UZ16;
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265 AVLAR-EHGIPFFAVAPLSSIDMSLKSGKEIPIEERSPEEVLTCGGCRIAPD----- 315
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287 VPVKVSVTEVKRHKLETGIRLD 308

316 VPVYNPAFDVTPHKYVTGIITD 337

Search completed: November 9, 2002, 01:19:27 Job time : 30 secs

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GenCore version 5.1.3 Copyright (c) 1993 - 2002 Compugen Ltd.

OM protein - nucleic search, using frame_plus_p2n model

9, 2002, 01:23:59; Search time 1941 Seconds (without alignments) 5081.428 Million cell updates/sec November Run on:

US-09-857-669-2 3173 1 MMIKPTALLLPALFFFPHAY......IAYGHSDKKIRWHISLGTRF Title: Perfect score: Sequence:

**BLOSUM62** Scoring table:

0.5 Xgapop 10.0 , Xgapext Ygapop 10.0 , Ygapext Fgapop 6.0 , Fgapext Delop 6.0 , Delext 16154066 seqs, 8097743376 residues Searched:

Total number of hits satisfying chosen parameters:

Minimum DB seq length: 0 Maximum DB seq length: 20000000000

Post-processing: Minimum Match 0% Maximum Match 100% Listing first 45 summaries

Command line parameters:

em_estba:* EST:* Database :

em_esthum: *
em_estin: *
em_estmu: *
em_estcov: * em_estpl:* em_estro:* em_htc:* qb_estl:*

gb_est2:*
gb_htc:*
gb_est3:*
gb_est4:*
gb_est4:* 

em_gss_inv:* em_gss_pln:* em_gss_hum:* em_estfun:* em_estom:* db_gss:*

em_gss_vrt:* em_gss_fun:* em_gss_mam:*

em_gss_mus:* em_gss_other:* em_gss_pro:* em_gss_rod:*

Pred. No. is the number of results predicted by chance to have a score greater than or equal to the score of the result being printed, and is derived by analysis of the total score distribution.

SUMMARIES

Description		22	557254 AV557254	396320 AG-ND-16	59389 EST414	91135 687022D0	2711 Mus mus	520 Zea mays	3211 614073B	3685	178	923	91	250	387	592	176	306	524	3975	2838	1231	3625		5617	9446	1709 QGI12J1	3447	2562 QGI16A1	5018 QGI6020	5030 QGI6P11	1536 QGI5M18	0925 QGB1	1570	9327	5465 AGENCOUR	4719 60268832	13324 Hom	75852 QGI9E21	75483 QGI8E01.	74935 OGI6K24	721 OGC11A18	74292 0614019	0286100 98657	486 OGISH	75563 OCIBELS	Total Katanta.
ID		0622	55725	H39632	5938	-	00271	10952	5321	868	478	923	16	25	BQ723872	59	AK01176	BM43806	BQ87624	BH77097	BQ87283	BQ87123	BM56062	BQ875918	BF53561	BC03544	BQ87170	BQ47944	BQ87256	BQ87501	BQ87503	BQ87453	BQ85092	BQ87157	BM91932	BQ67546	BG70471	BC01332	BQ87585	BQ87548	B087493	B085872	BO87429	BO87598	BO87448	BO87556	מר הי המלום
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RESULT 1 BQ506223/c LOCUS DEFINITION

EST613638 Generation of a set of potato cDNA clones for microarray analyses mixed potato tissues Solanum tuberosum cDNA clone STMGI92 3' end, mRNA sequence.
BQ506223
BQ506223.2 GI:21922105 ACCESSION

VERSION KEYWORDS SOURCE

ORGANISM

potato.
Solanum tuberosum
Bukaryota, Viridiplantae; Streptophyta; Embryophyta; Tracheophyta;
Spermatophyta; Magnoliophyta; eudicotyledons; core eudicots;
Asteridae; eussterids I; Solanales; Solanaceae; Solanum.
1 (bases 1 to 792) REFERENCE

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394 GTGGTC--------GGTAATTTTCCACCTCATGAAGCATTTGTGCTTGGTGGAACC 347
                                                                                                                                                                                                              253 TTAGAAGGGCCTGTATTTGCTGATTATGGCACAGACCTTGGATCTGGTCCAAGTGTTCCT 194
                                                                                                           529 LeuProGluArgAlaLeuLeuValGlySerLeuGluTyrGlnLeuProPheThrArgThr
                                          -----GAAGGCACAGTT
                                                                                                                                                                             549 LeuSerGlyAlaValPheHisAspMet------
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/organism="Arabidopsis thaliana"
/strain="Columbia"
/db_xref="taxon:3702"
/clone="S0064a09F"
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Mismatches:
Indels:
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Matches:
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                                                                          346 AATAGTGTAAGAGGATATGAA-----
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MEDLINE
COMMENT
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TITLE
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KEYWORDS
SOURCE
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XhoI; supplier: Combination of untreated and Phytophthora
infestens-treated libraries of stolons, leaves, leaflets,
axillary buds of stem explants, petioles, germinating eyes
tubers, or 159 g 177 t
                                                                                                                                                                      Email: potato@tigr.org
This clone is available through the Research Genetics, contact the
Research Genetics for further information 1-800-711-6195 or
                                                                                                                                                                                                                                                                                                                                               /clone_lib="Generation of a set of potato cDNA clones for microarray analyses mixed potato tissues."
/tissue_type="mixed tissues"
/lab_host="SOLR"
Buell,C.R., Hart,A., Baker,B., Tanksley,S., Fry,W., Smart,C., Restrepo.S., Griffiths,H., van der Hoeven,R., Tsai,J. and Karamycheva,S.A. Griffiths,H., van der Hoeven,R., Tsai,J. and Generation of a set of potato cDNA clones for microarray analyses Unpublished (2002)
On Jun 10, 2002 this sequence version replaced g1:21365092.
Other_ESTs: ESTG13637
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         360 ThrSerAsnValSerTyrAsnArgSerThrThrGlnAsnLeuGluLysArgAlaPheSer 379
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                380 GlyGlyIleTrpTyrValArgAspArgAlaGlyIleAspAlaArgLeuGlyAlaGluPhe 399
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               640 ATAAGGGACTACTACAGTAGTCCACTTACT-----GCAAGTGGCAACACTCATGATGAT 587
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                                                                                                                                        The Institute for Genomic Research
9712 Medical Center Dr. Rockville, MD 20850, USA
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Matches:
Conservative:
Mismatches:
Indels:
                                                                                                                                                                                                                                                                                              /organism="Solanum tuberosum"
/cultivar="Kennebec or Binjte"
/db_xref="texon:4113"
/clone="STMG192"
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1. .792
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Best Local Similarity:
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AV557254 Arabidopsis thaliana green siliques Columbia Arabidopsis thaliana cDNA clone SQ064a09F 3', mRNA sequence.
AV557254 AV557254.1 GI:8728669
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Bukaryota; Viridiplantae; Streptophyta; Embryophyta; Tracheophyta;
Bukaryota; Viridiplantae; Streptophyta; Embryophyta; Tracheophyta;
Spermatophyta; Magnoliophyta; eudicotyledons; core eudicots;
Rosidae; eurosids II; Brassicales; Brassicaceae; Arabidopsis,
1 (bases I to 607)
Asamizu,E., Nakamura,Y., Sato,S. and Tabata,S.
A large scale analysis of cDNA in Arabidopsis thaliana; Generation of 12,028 non-redundant expressed sequence tags from normalized and size-selected cDNA libraries
DNA Res. 7, 175-180 (2000)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    The First Laboratory for Plant Gene Research
Kazusa DNA Research Institute
Yana 1532-3, Kisarazu, Chiba 292-0812, Japan
Email: asamizu@kazusa.or.jp, URL:http://www.kazusa.or.jp/en/plant/.
Location/Qualifiers
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/tissue_type-"green siliques"
/note-"Vector: pBluescriptII SK-; Site_1: EcoRI; Site_2:
577
                                                                              193 GGTGATCCTGCTGGAGCCAAGGCTAAAACCTGGAAGTGGATGTGGATGTGGGGTTGGTATT 134
                                                                                                                                                             578 ArgTrpPheSerProLeuAlaProPheSerPheAspIleAlaTyrGlyHisSerAspLys 597
                                                                                                                                                                                                                   133 CGCGTAGACTCGCCCCTGGGACCTTTAAGATTAGAGTATGCCTTC---AATGACCAGCGG 77
558 GlyAspAlaAlaAlaAsnPheLysArgMetLysLeuLysH1sGlySerGlyLeuGlyVal
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FEATURES Location/Oualifiers source 1649 /organism="Anopheles /strain="PeET" /db_xref="taxon:7165' /clone="AG-ND-161M3" /clone="AG-ND-161M3" /note="Vector: pECBAC BASE COUNT 146 a 182 c 183 g	Alignment Scores: 0.000233 Ler Score: 125.00 Mai Score: 125.00 Mai Percent Similarity: 42.67% Con Best Local Similarity: 30.00% Mis Ouery Match: 3.94% In DB: 17 Match: 17 Gal US-09-857-669-2 (1-609) x BH396320 (1-649	, SGC /Le /Le /Le /Le /Le	461 535 410	Oy 549 LeuSerGlyAlaValPheHisAspMetGlyAlaDb 350 CTGCGTCTGTGCGTTCGTGGGTGGTAAA
Oy 464 AlaArgAlaGlyTyrPhePheThrPrGluAsnLysLeuGlyThrPheIleIleArg 483	492 GTCATCGGTGGAACAACAGCGTAAGAGGTTACGAA	558	Thrarg 608	RESULT 3 BH396320/C BH396320/C BH396320 BH396320.1 GI:17342461  KEYGORDS SOURCE African malaria mosquito. GSS. SOURCE ANDHALES gamblas equals and sequences and sequences and sequences. AUTHORS GSS. ANDHALES JLOGGAS. ANDHALES JLOGGAS. ANDHALES JLOGGAS. ANDHALES JLOGGAS. ANDHALES SHEARY.J. KBO.H., COllins,F., Gardner,M. and Loftus,B.J. TITLE Direct Sibnission of BAC-end sequences from Anopheles gambiae COMMENT COMMENT COMMENT COMMENT COMMENT CONTEXT: Brendan J Loftus Department of Endrayotic Genomics Tel: 301 BN3 S43 Email: blioftusfettgr.org FRX: 301 BN3 S43 Email: blioftusfettgr.org THS collins and sequenced by The Institute for Genomic Research (TIGR). The BAC library was generated from A gamblae PEST strain DNA All DNA WAS SEXTRACEED from metry hatched first instar larvae to minimize the inclusion of DNA from microorganisms that inhabit the gut. The DNA is derived from microorganisms that inhabit plantal digest. Seq pinner: M3 Rev Class: BAC ends. Seq pinner: M3 Rev Class: BAC ends.

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503 bp mRNA linear EST 18-MAY-2001 leveloping/immature green fruit Lycopersicon one CLEM6L23, mRNA sequence.
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noliophyta; eudicotyledons; core eudicots;
ids I; Solanales; Solanaceae; Solanum;
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ov.J., White,R., van der Hoeven,R.S., Holt,I.E.,
T.S., Craven,M.B., Bowman,C.L., Ronning,C.M.,
r,C.M., Martin,G.B., Giovannoni,J.J. and Tanksley
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                                                                                                                                                                                                                                                                                         nAlaGlyTyrThrValAlaArgAspAsnAlaAspValPro 498
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GCTGGGCTGGGCCTGGGCGGCAACCCCTATCCC
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'G-ND-161M3"

-B-"ND-TAM"

ctor: pECBAC1; Site_1: HindIII"

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Matches:
Conservative:
Mismatches:
Indels:
"Anopheles gambiae"
PEST"
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GI:6465676

AW191135.1

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                                                                                                                                                                                                                                                                                               /note="Vector: pBluescriptSKmCUadapt; Site_1: EcoR1; Site_2: Xhol; Fruit were tagged at 5 dpa (0.5 cm) and harvested at 7 day intervals through 35 dpa. Equal masses of tissue from each stage were combined (including seeds and locules) prior to mRNA isolation."
                                                                                                                                                                                                                           /clone_lib="tomato developing/immature green fruit"
/tissue_type="fruit"
/dev_stage="immature green (5-35 days post-anthesis)"
/lab_host="SOLR"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   539
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       282 GAAATTTCCTTCCCTCTGATGGGGCCACTAGAAGGGGCTGTATTTGCTGATTATGGCACA 341
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               402 AGTGGATATGGATGTGGGGTTGGTATTCGCGTAAAGTCGCCACTGGGACCTCTAAGATTA 461
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       96 GTCAATGCTCGTGCTAGAAAAGGATTGGTATTAGGTCCTATGCGT-------
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           342 GACCTTGGATCTGGTCCAAGTGTTCCTGGTGATCCTGCTGGAGCAAGGCTAAAACCTGGA
                                               Clemson University
100 Jordan Hall, Clemson, SC 29634, USA
Emall: http://www.genome.clemson.edu/orders/index.html
5 prime sequence.
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                                                                                                                                                         /organism="Lycopersicon esculentum"
/cultivar="TA496"
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Matches:
Conservative:
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              Contact: CUGI
Clemson University Genomics Institute
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Gaps:
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/clone="cLEM6L23"
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Unpublished (2000)
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Best Local Similarity:
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Eukaryota, Viridiplantae, Streptophyta, Embryophyta, Tracheophyta, Spermatophyta, Magnoliophyta; Liliopsida, Poales, Poaceae; PACC clade, Panicoideae; Andropogoneae; Zea.

1 (bases 1 to 494)
Walbot,V.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               465 ArgAlaGlyTyrPhePheThrProGluAsnLysLysLeuGlyThrPheIleIleArgGly 484
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                                                                                                         Maize ESTs from various cDNA libraries sequenced at Stanford University Unpublished (1999) Contact: Walbot V
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      GlnAlaGlyTyrThrValAlaArgAspAsnAlaAspValProSerGlyLeuMetPheArg
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                                                                                                                                                                   Department of Biological Sciences
Stanford University
855 California Ave, Palo Alto, CA 94304, US,
Tel: 650 723 227
Fax: 650 725 8221
Email: walbot@stanford.edu
Plate: 687022 row: D column: 06.
Location/Qualifiers
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Mismatches:
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                                                                                                                                                                                                                                                                                                                                                                                                               AKO02711 2776 bp mRNA linear HTC 19-JAN-2002
Mus musculus adult male kidney CDNA, RIKEN full-length enriched
library, clone:0610030001:phosphofructokinase, muscle, full insert
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---- GlyAspAlaAlaAlaAsnPheLysArgMetLysLeuLysHisGlySer 573
                                                    247 CCTAAAGTTCCTGGTGACCCAGCCGGAGCTCGTGGAAAGCCAGGGAGTGGCTTTGGCTAT 188
                                                                                                                  GlyLeuGlyValArgTrpPheSerProLeuAlaProPheSerPheAspIleAlaTyrGly 593
                                                                                                                                                    AK002711.1 GI:12832895
HTC: CAP trapper.
Mus musculus (strain:C57BL/6J) adult male kidney cDNA to mRNA, clone_lib:RIKEN (111-length enriched mouse cDNA library
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High-efficiency full-length cDNA cloning
Meth. Enzymol. 303, 19-44 (1999)
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Adachi.J., Aizawa,K., Akahira,S., Akimura,T., Aono,H., Aral,A., Arakawa,K., Arahira,Bono,H., Brownstein,M., Bult,C., Carninci,P., Fukuda,S., Fukuda,S., Fukunishi,Y., Furuno,M., Hanagaki,T., Hara,A., Hayatsu,N., Hill,D., Hiramoto,K., Hiraoka,T., Hori,F., Hume,D., Imoteni,K., Ishi,Y., Itoh,M., Izawa,M., Kasukawa,T., Kato,H., Kawai,J., Kojima,Y., Konjima,Y., Konjima,Y., Rond,M., Koya,S., Numazaki,R., Ohno,M., Okazaki,Y., Okido,T., Owa,C., Quackenbush,J., Saito,H., Sakai,C., Sakai,C., Sakai,C., Sakai,D., Santo,H., Sasaki,D., Sakai,C., Sakai,C., Sakai,C., Sakai,T., Yagawa,A., Shiraki,T., Sojabe,Y., Suzuki,H., Tagami,M., Tagawa,A., Takahashi,F., Tanaka,T., Tejima,Y., Toya,T., Yamamura,T., Yamanaka,I., Yasunishi,A., Yoshida,K., Yoshino,M., Muramatsu,M. and Hayashizaki,Y. Direct Submission

Submitted (10-JUL-2000) Yoshihide Hayashizaki, The Institute of Exploration Research Group, RIKEN Gemomic Sciences Center (GSC), RIKEN Yokohama Institute; I-7-2 Suehlro-cho, Tsurumi-ku, Yokohama, Kanagawa 230-0045, Japan (E-mail:genome-res8gsc.riken.go.jp, Fax:81-45-503-9216)

Please visit our web site (http://genome.gsc.riken.go.jp/) for furthy.
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/clone_lib="RIKEN full-length enriched mouse cDNA library"
/dev_stage="adult"
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/traslaton="MTHERHAAKTLCIGKAIAVLTSGGDAQGMNAAVRAVVRVGIFT
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TSLSCGADWYFIPECEPDDDMERHLCREINGSRLNIIIVAGSAIDKNGKPITS
EDIKNLVVKRLGYDTRVTVLGHVQRGGTPSAFDRILGSRMGVEAVMALLEGTPDTPAC
Functional annotation of a full-length mouse cDNA collection
Nature 409 (6821), 685-690 (2001)
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/db_xref-"MGD:MGI:1907168"
/db_xref-"taxon:10090"
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/db_xref="G1:12832896"
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VTIFTMGGCCGYLATWAGLAAGADAAY IFEBEPTIRDLOWYNFHLVOWKMTTYKRGL
VLRNRKCNBYTTDFFILVSEGKGI FDSRKNVLGHMQGGSPTFPDRNRATKMGAA
AMNNMSGKI KESYRNGRIFANTPDSGCVLGMRKRALVFQPVTELKDOTDFEHRIPKEO
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2776
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                                                                                                     -----GlyGlyLys-----IleAlaTyrAspTyrTyrAsnLeuPheAsnLysGlyTyr
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        -----ACCTATGTTGGAGGC---TGGACTGGTCAAGGTGGTTCCAAACTTGGTACT
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                                                                  ---ValSerValThrGlu
                                                                                                                                                                                                    Val-----LysArgHisLysLeuGluThrGlyIleArgLeuAspSerGluTyrGlyLeu
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         350 GlnProArgAsnTyrArgGlyAsnTyrTrpThrSerAsnValSerTyrAsnArgSerThr
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                                                                      -----ArgValProValLys----
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	Db 533 CTCTCCGTAGGGACGCACAGCGAAGGGCCATCCAGGCCGACGGCGCCACGCGCGTC 589
Oy 572	
Db 2149 ATCTTGCCAACACCCTGACTCAGGTGCGTTCTGGGGATGCGTAAGAGGGCCCTGGTC 2208	Cy 213 ASINGIVAIVAIGASDELGIYAIGKIOILEALAFINGLIYASPENGGUNIERINGIY 231
Qy 580 PheserProLeualaProPheSerPheAspIleAlaTyrGlyHisSerAspLysIle 599	> 100.00 1 100.00 1 100.00 100.10 100.10 100.10 100.10 100.10 100.10 100.10 100.10 100.10 100.10 100.10 100.10 100.10 100.10 100.10 100.10 100.10 100.10 100.10 100.10 100.10 100.10 100.10 100.10 100.10 100.10 100.10 100.10 100.10 100.10 100.10 100.10 100.10 100.10 100.10 100.10 100.10 100.10 100.10 100.10 100.10 100.10 100.10 100.10 100.10 100.10 100.10 100.10 100.10 100.10 100.10 100.10 100.10 100.10 100.10 100.10 100.10 100.10 100.10 100.10 100.10 100.10 100.10 100.10 100.10 100.10 100.10 100.10 100.10 100.10 100.10 100.10 100.10 100.10 100.10 100.10 100.10 100.10 100.10 100.10 100.10 100.10 100.10 100.10 100.10 100.10 100.10 100.10 100.10 100.10 100.10 100.10 100.10 100.10 100.10 100.10 100.10 100.10 100.10 100.10 100.10 100.10 100.10 100.10 100.10 100.10 100.10 100.10 100.10 100.10 100.10 100.10 100.10 100.10 100.10 100.10 100.10 100.10 100.10 100.10 100.10 100.10 100.10 100.10 100.10 100.10 100.10 100.10 100.10 100.10 100.10 100.10 100.10 100.10 100.10 100.10 100.10 100.10 100.10 100.10 100.10 100.10 100.10 100.10 100.10 100.10 100.10 100.10 100.10 100.10 100.10 100.10 100.10 100.10 100.10 100.10 100.10 100.10 100.10 100.10 100.10 100.10 100.10 100.10 100.10 100.10 100.10 100.10 100.10 100.10 100.10 100.10 100.10 100.10 100.10 100.10 100.10 100.10 100.10 100.10 100.10 100.10 100.10 100.10 100.10 100.10 100.10 100.10 100.10 100.10 100.10 100.10 100.10 100.10 100.10 100.10 100.10 100.10 100.10 100.10 100.10 100.10 100.10 100.10 100.10 100.10 100.10 100.10 100.10 100.10 100.10 100.10 100.10 100.10 100.10 100.10 100.10 100.10 100.10 100.10 100.10 100.10 100.10 100.10 100.10 100.10 100.10 100.10 100.10 100.10 100.10 100.10 100.10 100.10 100.10 100.10 100.10 100.10 100.10 100.10 100.10 100.10 100.10 100.10 100.10 100.10 100.10 100.10 100.10 100.10 100.10 100.10 100.10 100.10 100.10 100.10 100.10 100.10 100.10 100.10 100.10 100.10 100.10 100.10 100.10 100.10 100.10 100.10 100.10 100.10 100.10 100.10 100.10 100.10 100.10 100.10 100.10 100.10 100.10 100.10 100.10 100.10 100.10 100.10 100.10 100.10 100.10 100.10 100
Db 2209 TTCAGCCAGTAACTGAGCTGAAGGACCAGACAGACTTTGAACACCGAATCCCCAAAGAA 2268	THIGHTHY TYPE OCH UCINT LEVAL SETCH Y LEUALAARIGPREGIN
Oy 600 ArgrrpHisIleSerLeu 605 :::	248 ProGlyThrProTyr
TIOS	Db 695 CCTGGATTACCTTATGTTGAGGAGGCAATTACCAATGCTGGTGACTGGTTGATTGGTGGG 754
AY109520 LOCUS AY109520 1829 bp mRNA linear HTC 25-MAY-2002 DEFINITION 2ea mays CL30_1 mRNA sequence.	Qy 253 AspLeuAspLeuLeuLeuAspPheGlnGlnAlaLeuGluGlnAsnGlyHisTyr 270
z	Qy 271 SerGlyAlaSerValGlnAlaAspPheAspArgLeuGlnGlyAspArgVal 287
REIMONDS HIC. SOURCE Zea mays. ORGANISM Zea mays.	Db 812 TCTCCAGCACAGCTGCGTGAAGAGTTTGCCAGGCGCAATGCTGATGCATATTGCCTTT 871
	Qy 288ProValLysValSerValThrGluValLysArgHis 299
REFERENCE 1 (bases 1 to 1829) AUTHORS Hainey, C.F., Dolan, M., Miao, G.H., Vogel, J.M., Whitsitt, M.S.,	Qy 300 LysheuglufhrGlylleArgLeuAspSerGlufyrGlyLeuGlyGlyLyslle 317
Althrib.m., manaley,m., morgance,m. and lingey,s.v. TITLE Malze Mapping Project/DuPont Consensus Sequences for Design of Overed Perhas	Db 932 CTCCTTGAGATGGGTTATNNNNCCCTGTTCTTCTGCTCCACTGGGAGGA 985
	<pre>Qy 318 AlaTyrAspTyrTyrAsnLeuPheAsnLysGlyTyrIleGlySerValValTrpAspMet 337    </pre>
	Db 986
AL Submitted (; Missouri, Cc S Loc	OY 338 AsplysTyrGluThrThrLeualaalaGlyIleSerGlnProArgAsnTyrArgGlyAsn 357 :::::
source 11829 //organism="Zea mays" //db_xref="MaizeDB:631282"	Oy 358 TyrTrpThrSerAsnValSerTyrAsnArgSerThrThrGlnAsnLeuGluLysArgAla 377
/clone="fc13" / clone="fc13" / clone	1000 AICIIICCCICICCABICCAIIIAIGCI GGGCCARCIGAGGIGCAG
Library*  //note="this sequence is part of a project of EST"	reservation for the first first for the first form of the first fo
assemblies resulting from the application of public contigs to seed DuPont contigs; this resource was assembled by DuPont as part of a collaboration for the	398 GluPheLeuAlaGluGlyArgLysIleProGlySerAspIleAspLeuGlyAsnSerHis 
	Db 1163 AATTTCTATATTGTTGGAAGGGATCCTGCTGCTGTATGAGCCAT 1204
BASE COUNT 369 a 393 c 442 g 383 t 242 others .	Qy 418 AlaThrMetLeuThralaSerTrpLysargGlnLeuLeuAsnasnVal 433
0.0109 Length:	Qy 434 LeuHisProGluAsnGlyHisTyrLeuAspGlyLysIleGlyThrThrLeuGlyThrPhe 453
t Similarity: 34.838 ocal Similarity: 23.138	Db 1265 CCTGGCCTCGAGAGGCTCAACATCCTTTCAAGGTG1303
3,69% Indels: 11 Gaps:	454 LeuSerSerThrAlaLeuIleArgThrSerAlaArgAlaGlyTyrPhePheThrProGlu
US-09-857-669-2 (1-609) x AY109520 (1-1829)	1304GCTGCATATGACACAAAAGAAAAGAAAATGGATTTCTTTGATCCATCA
160 GluAsnTrpGlnGlnProValGlySerAspPheAspGlnAspSer	Qy 474 AsnLysLysLeuGlyThrPheIleIleArgGlyGlnAlaGlyTyrThrValAlaArgAsp 493 
413 GAAGGGTGGGCGAGTCCGCTGCAAGGGTTCATGCGCGACGATGAGTTCCTCCAAACACTT	Qy 494 AsnalaaspValProSerGlyLeuMetPheArgSerGlyGlyAlaSerSerValArgGly 513
OY 175 TrpGluAsnSerLysThrSerValLeuGlyAlaValThrArgLysGlyTyrProLeuAla 194  Db 473 CACTTTAATGCCATCCGCGGGCAGGATGGTCAACATGGTCACCTCCCCATCGCATGG5 532	1409
	Qy 514 TyrGlu 515         :::   Db 1469 TATGAC 1474

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HTC 25-MAY-2002
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Zea mays
Eukaryota; Viridiplantae; Streptophyta; Embryophyta; Tracheophyta;
Spermatophyta; Magnoliophyta; Liliopsida; Poales; Poaceae; PACC
clade; Panicoldeae; Andropogoneae; Zea.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        /note="this sequence is part of a project of EST assemblies resulting from the application of public contigs to seed DuPont contigs; this resource was assembled by DuPont as part of a collaboration for the overgo addressing of BACs in conjunction with the Maize Mapping Project"
                                                                                                                                                                                                                                                                                                            1 (bases 1 to 503)
Hainoy, C.F., Dolan, M., Mao, G.H., Vogel, J.M., Whitsitt, M.S., Arthur, L.W., Hanafey, M., Morgante, M. and Tingey, S.V. Maize Mapping Project/DuPont Consensus Sequences for Design of Overgo Probes
Unpublished (2002)
2 (bases 1 to 503)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 506 GlyGlyAlaSerSerValArgGlyTyrGluLeuAspSerIleGlyLeuAlaGlyProAsn 525
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463 GGTGCTGTTGGCTCTTGTTTATGCTGTAGTTGTGTGAAGTGTCATGCCGCATG 404
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   /db_xref="MalzeDB:637445"
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Library"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    526 GlySerValLeuProGluArgAlaLeuLeuValGlySerLeuGluTyrGlnLeuProPhe
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Submitted (25-APR-2002) Malze Mapping Project, University
Missouri, Columbia, MO 65211, USA
Location/Qualifiers
1. .503
/organism="Zea mays"
                                                                                                                                                linear
                                                                             GGTCAGATCCGTGTCGACTACGCTATGAATGCATTTAACCGCAAA 205
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38
11
43
43
                                                 584 AlaProPheSerPheAspIleAlaTyrGlyH1sSerAspLysLys
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26a mays PC0127797 mRNA sequence.
AY108685 GI:21211868
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                                             588 bp mRNA linear EST 20-SEP-1999 CDNA library from Walbot Lab Zea mays CDNA,
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ECORI; Site_2: XhoI; 3-4 days old root tissue from Walbot
                                                                                                                                                                            Eukaryota, Viridiplantae; Streptophyta; Embryophyta; Tracheophyta; Spermatophyta; Magnolliophyta; Liliopsida; Poales; Poaceae; PACC clade; Panicoideae; Andropogoneae; Zea.
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/organism="zea mays"
/dulaxief="taxon:4577"
/clone_lib="614 - root cDNA library from Walbot Lab"
/fev_stage="root"
/dev_stage="3-4 days old"
/lab_host="XLOLR"
                                                                                                                                                                                                                                                          Maize ESTs from various cDNA libraries sequenced at Stanford University
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Stanford University
855 California Ave, Palo Alto, CA 94304, USA
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Contact: Walbot V
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Fax: 650 725 8221
Email: walbot@star
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Best Local Similarity:
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Zea mays
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Arakawa,T., Hara,A., Fukunishi,Y., Konno,H., Adachi,J., Fukuda,S.,
Alzawa,K., Izawa,M., Nishi,K., Kiyosawa,H., Kondo,S., Yamanaka,I.,
Saito,T., Okazaki,Y., Gojobori,T., Bono,H., Kasukawa,T., Saito,R.,
Kadota,K., Matsuda,H., Ashburner,M., Batalov,S., Casavant,T.,
Fleischman,W., Gasterland,T.; Gissi,C., King,B., Kochiwa,H.,
Kuchi,P., Lewis,S., Matsuo,Y., Nikaido,I., Pesole,G.,
Kuchi,P., Lewis,S., Matsuo,Y., Nikaido,I., Pesole,G.,
Ragner,L., Washio,T., Sakai,K., Okido,T., Furuno,M., Aono,H.,
Baldarelli,R., Barshi,G., Blake,J., Boffelli,D., Bolinga,N.,
Fletcher,C., Fujita,M., Gariboldi,M., Gustinoich,S., Hill,D.,
Hofmann,M., Hume,D.A., Kamiya,M., Lee,N.H., Lyons,P.,
Marchionni,L., Mashima,J., Mazzarelli,J., Mombaerts,P., Nordone,P.,
King,B., Ringwald,M., Rodriguez,I., Sakamoto,N., Sasaki,H.,
Sato,K., Schonbach,C., Seya,T., Shibata,Y., Storch,K.F., Suzuki,H.,
Paya,R., Yoshida,K., Hasegawa,Y., Kawaji,H., Kohtsuki,S.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Carninci, P., Shibata, Y., Hayatsu, N., Sugahara, Y., Shibata, K., Itoh, M., Konno, H., Okazaki, Y., Muramatsu, M. and Hayashizaki, Y. Normalization and subtraction of cap-trapper-selected cDNAs to prepare full-length cDNA libraries for rapid discovery of new genes Canoma Res. 10 (10), 1617-1630 (2000)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Shibata, K., Itoh, M., Aizawa, K., Nagaoka, S., Sasaki, N., Carninci, P., Konno, H., Akiyama, J., Nishi, K., Kitsunai, T., Tashiro, H., Itoh, M., Suni, N., Ishii, Y., Nakamura, S., Hazama, M., Nishine, T., Harada, A., Yamamoto, R., Matsumoto, H., Sakaguchi, S., Ikegami, T., Kashiwaqi, K., Yonawanoto, R., Togawa, Y., Izawa, M., Ohara, E., Watahiki, M., Yohara, T., Ishikawa, T., Ozawa, K., Tanaka, T., Matsuura, S., Kawai, J., Okazaki, Y., Muramatsu, M., Inoue, Y., Kira, A. and Hayashizaki, Y. RIKEN integrated sequence analysis (RISA) system--384-format sequencing pipeline with 384 multicapillary sequencer
                                                                                                                                                                                                                                                                                  HTC 19-JAN-2002
                                                                                                                                                                                                                                                             Mus musculus adult male lung cDNA, RIKEN full-length enriched library, clone:1200015#18:transformed mouse 3T3 cell double minute l. full insert sequence.
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                                                    283 GTTGGCGTCCGCGTGGACTCCCCCTCTGGGACCTCTACGGCTTGAG-----TACGCCTT 230
575 LeuGlyValArg-TrpPheSerProLeuAlaProPheSerPheAspIleAlaTyrGlyHi 594
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Nature 409 (6821), 685-690 (2001)
21085660
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                                                                                                                                              229 TAATGATAGGCAAGCAAGCAATTTCACTTTGGTGTTGGCTACAGA 184
                                                                                                           594 sSerAspLysLysIle---ArgTrpHisIleSerLeuGlyThrArg
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High-efficiency full-length cDNA cloning
Meth. Enzymol. 303, 19-44 (1999)
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356 yAsnTyrTrpThrSerAsnValSerTyrAsnArgSerThrThrGlnAsnLeuGluLysAr
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                                                                                                                                                                                                                                          134 IlealaAsnValGlyValAlaIleLeuGlyAspIle---LeuSerAspGlyAsnLeuAla 152
                                                                                                                                                                                                                                                               GTCGGCGGGCGCGCCTCCGCAGCGCAGCGCGACATGCCGGTGCGCTTCAAGGGGCTGAGT 111
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        334 CCAGAACCCCAGGCCTTTG-----GAACGCCAAAGCCACAAGAGCTGAG 378
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           284 yAspArgValProValLysValSerVal --- ThrGluValLysArgHisLysLeuGluTh 303
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     rLeuAlaAlaGlyIleSerGlnProArgAsn---------TyrArgGl 356
                                                                                                                                                                                                                                                                                    ------GlySerAspPheAspGlnAspSerTrpGluAsnSe
                                                                                                                                                                                                                                                                                                                                                                            rLysThrSerValLeuGlyAlaValThrArgLysGlyTyrProLeuAlaLysLeu----
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                                                                                                                                                                                                                                                                                                                                               CCTCACTGGGACAAAAGTACTCATGGGCAGGACTTAGATCGGATCAGTTGGGGATCACG
                                                                                                                                                                                                                                                                                                                                                                                                   226 AAAGAACCAGGTTTTA----TTTCAAAAGAAGAGTTCCCTACCATGACCCTCAGATT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                    lAspSerGlyArgProlleAlaPheGlyAspPheGluIleThrGlyThrGlnArgTyrPr
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                oGluGlnIleValSerGlyLeuAlaArgPheGln------ProGlyThrProTy
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               rGlylleArgLeuAspSerGluTyrGlyLeuGlyGlyLyslleAlaTyrAspTyrTyrAs
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120
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200
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Mismatches:
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Matches:
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Gaps:
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3045
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689 c 747
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108.00
35.52%
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                          polyA_signal
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                                                          polyA_site
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ORIGIN
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BIS59235 1077 bp mRNA linear EST 05-SEP-2001
603240861F1 NCI_CGAP_Mam4 Mus musculus cDNA clone IMAGE:5293910 5',
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Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Euteleostomi;
Mamaalia; Eutheria; Rodentia; Sciurognathi; Muridae; Murinae; Mus.
1 (bases 1 to 1077)
NIH-MGC http://mgc.nci.nih.gov/.
National institutes of Health, Mammalian Gene Collection (MGC)
Unpublished (1999)
Contact: Robert Strausberg, Ph.D.
Tissue Procurement: Lothar Hennighausen Ph.D., Priscilla Furth
Ph.D.
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            1326 AAAAGTTGCCTC--GGGAGAGCAGCCCCTGAAAACTCCACCAGGAGACTGGAGATGCCA 1383
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         484
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gAlaPheSerGly-----GlyIleTrpTyrValArgAspArgAlaGlyIleAspAlaAr 394
                                           924 AGACATGGCGTCGGAAGACTCAGACCAGTCTGTAAAGAAGCCTGCTTCATGGAGACACCA
                                                                                                                                                                                                                                                                                                                                                                                      nLeuLeuAsnAsnValLeuHisProGluAsnGlyHisTyrLeuAspGlyLysIleGlyTh
                                                                                                                                                                                                                                                                                                                                                                                                                          476 sLeu------GlyThrPheIleIleArgGl
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     1101 GCTCCGAGAAAAGGCCGAATCTTACAGGAAGCGAGTTCAGGGGACACATTTTTCTCGGGA
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         CCATCTGAACCAGATTATGTCGGACAGCAACTGCTGTTGGGACGTCTCCTCAGTCACAAG
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            521 euAlaGlyProAsnGlySerValLeuProGluArgAlaLeuLeuValGlySerLeuGluT
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                                                                                                                             gLeuGlyAlaGluPheLeuAlaGluGlyArgLysIlePro------GlySerAspIl
                                                                                                                                                                                         CAGCAGTCTGGAGATGCTGACTCCAGTAAAGAAGGCAGATGAGCCTTTAGAACTTAGAAGT
                                                                                                                                                                                                                                                        eAspLeuGly ----- AsnSerHisAlaThrMetLeuThrAlaSerTrpLysArgGl
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D46516 353 bp mRNA linear EST 03-APR-2002
RICS11241A Rice green shoot Oryza sativa (japonica cultivar-group)
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Oryza sativa (japonica cultivar-group).
Eukaryota: Viridiplantae; Streptophyta: Embryophyta; Tracheophyta; Spermatophyta; Magnoliophyta; Lillopsida; Poales; Poaceae;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Unpublished (1995)
Contect: Takuji Sasaki
National Institute of Agrobiological Resources
Rice Genome Research Program, Kannondai 2-1-2, Tsukuba, Ibaraki
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  URL:http://rgp.dna.affrc.go.jp/
                                                                                                                            ------ThrGlyThrGlnArgTyrPro-------GluGlnIleVal 240
                                                                                                                                                                                                                                                                            .....PheGlnGlnAlaLeuGluGlnAsnGlyHisTyrSerGlyAlaSerValGlnAla 277
                                                                                                                                                                                                                                                                                                   -------AspPheAspArgLeuGlnGlyAspArgValProValLysVal 291
                                                                                                                                                                                                                                                                                                                                                                                   TGGGAGGCTTCTTCACTCACCTTGTGAATTCTGGCTGAGAACGGGTTTCCTGCCCTTTC 787
                                                                                                                                                                                                                                                                                                                                                                                                                               ServalThrGluValLysArgHisLysLeuGluThrGlyIleArgLeuAspSerGluTyr 311
                                                                                                                                                                                                                                                                                                                                                                                                                                                                  ACCTGGTTGGGCATCCGAAAGACCTGGGATGACCGTGGGTCACGATGTGAGGAAAGCTAC 847
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       GlyLeuGlyGlyLysIleAlaTyrAspTyrTyrAsnLeuPheAsnLysGlyTyrIleGly 331
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          848 GGGGCCGCCGGGGACCTAGCG-------AGCAGAGGAAAGATCGGG 886
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                                                                                     /organism="Oryza sativa (japonica cultivar-group)"
/cultivar="Nipponbare"
/db_xref="taxon:39947"
                                                                                                                                                                                                                           211 AspLeuAsnValValValAspSerGlyArgProlleAlaPheGlyAspPheGluIle---
                                                                                                                                                                                                      SerGlyLeuAlaArgPheGlnProGlyThrProTyrAspLeuAspLeuLeuLeuAsp---
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Rice cDNA from callus 1995
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1 (bases 1 to 353)
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D46516
D46516.1 GI:700225
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Tel: 81-298-38-7441
Fax: 81-298-38-7468
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VERSION
KEYWORDS
SOURCE
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TITLE
JOURNAL
COMMENT
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               243 ATTGTGGAGGCTGCCAGCGGCAGGGCGCCATCGTGAC---GGGGATGGT--- 296
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    TyrThrValHisIleThrProGlyProArgThrLysIleAlaAsnValGlyValAla--- 140
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                -----IleLeuSerAspGlyAsn 150
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        LeuAlaGluTyrTyrArgAsnAlaLeuGluAsnTrpGlnGlnProValGlySerAspPhe 170
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         405 TTTGCC------TCCATTGT-GACTGGAGTAGAGGAGGTCGTCTGATTTT 448
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         191 TyrProLeuAlaLysLeuGlyAsnThrArgAlaAlaValAsnProAspThrAlaThrVal 210
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       --TTTGCCAGGACCTCTCCTCAGCAGAAGCTCATC 242
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           345 GGGATTGTTGGTCTGATGTGTCTCCAAGCTGCTGACATGATCCTTCTGGATGACAAC 404
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      484
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            MetLeuArgSerLysGlyTyrPheSerSerLysValSerLeuThrGluLysAspGlyAla 121
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    ValLeuAspLysGluGlnThrGlyPheLeuAlaGluGluAlaProAspAsnValLysThr 101
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            SerGluIleLysAspMetValGluGluHisLeuProLeuIleThrGlnGlnGlnGluGlu 81
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          31 AlaAlaGlyPheAlaLeuPheLysAsnLysSerProAspThrGluSerValLysLeuLys 50
             DNA Sequencing by: Incyte Genomics, Inc.
Clone distribution: MGC clone distribution information can left found through the I.M.A.G.E. Consortium/LLNL at:
http://image.llnl.gov
Plate: LLAMI1743 row: 1 column: 15
High quality sequence stop: 836.
Location/Qualifiers
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  449 GAT-------AACTTGAAGAATCCATCGCTTACACCCTAACC------
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Library Arrayed by: The I.M.A.G.E. Consortium (LLNL)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  51 ProLysPheProVal --- ArgIleAspThrGlnAsp-------
                                                                                                                                           1. .1077
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/tissue="type="tumor, gross tissue"
/lab_host="DH108"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Conservative:
Mismatches:
Indels:
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Matches:
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107.00
35.17%
21.26%
3.37%
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/dev_stage="symblotic, 4 days after contact"
/lab_host="Eucalyptus globulus bicostata"
/note="Norgan: ectomycorrhiza; Vector: pBluescript; Site_1:
EcoR1: The cDNA library was constructed from 1 ug total
ectomycorrhiza RNA using the SMART cDNA library
Construction kit (#K1051-1, Clontech, Palo Alto, CA, USA)
according to the manufacturer's instructions. cDNAs were
cloned into EcoR-ridested pBluescript."

a 175 c 167 g 126 t 1 others
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           185 ATGCCGGTCAAGAAACCGGATAACGCTGAAACCCAGATT----TTCCAATTCTCCCTCGGC 129
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                        -----LeuPro-----GluArgAlaLeuLeu
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485 CAGGGGACTGTGGCTGGACAACGACCGCTGCCATTCGGTGGTAACGTGATC
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          536 ValGlySerLeuGlu-----TyrGlnLeuProPheThr------ArgThrLeuSer
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305 CCGAATGGCTCGAAGTCCAACGCAGGGAAGGTGCAAGCTTCAGCAACCTGGCAAGG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            592 Tyr------GlyHisSerAspLysLysIleArgTrpHisIleSerLeuGly
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Matches:
Conservative:
Mismatches:
Indels:
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Xenopus laevis
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43.56%
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Pisolithus tinctorius.
Eukaryota; Fungi; Basidiomycota; Hymenomycetes; Homobasidiomycetes;
Eukaryota; Fungi; Basidiomycota; Hymenomycetes; Homobasidiomycetes;
Boletales; Sclerodermataceae; Pisolithus.
1 (bases 1 to 620)
Voiblet,C., Duplessis,S., Encelot,N. and Martin,F.
Identification of symblosis regulated genes in Eucalyptus
globulus-Pisolithus tinctorius ectomycorrhiza by differential
hypridization of arrayed cDNAs
Plant J. 25 (3), 1-12 (2001) In press
Contact: Martin,FM
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            1. .620 // Cognism="pisolithus tinctorius" // Acganism="41" // Ab_xref="taxon:37468" // Ab_xref="taxon:37468" // Ab_xref="taxon:37468" // Ab_xref="taxon:37164" // Ab_xref="taxon:37468" // Ab_xref="taxon:37468" // Ab_xref="taxon:37468" // Ab_xref="mantle and Hartig net hyphae"
                                                                                                                                                                                                                                                                                                                                                                            236
                                                                                                                                                                                                                                                                                                    126 AAATTGGGGCCAACATTTTTGGTTACTAGCTTGACAGGTGGTTCCATTGTGGGGGACATG 185
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Institut National de la Recherche Agronomique
Centre INRA de Nancy, 54280 Champenoux, France
Tel: +33 383 39 40 80
Fax: +33 383 39 40 69
Email: fmartinehancy.inra.fr
Insert Length: 620 5td Error: 0.00
Seq primer: Cappinder 5'CDS
POLYA-No.
                                                                                                        353
29
13
29
13
/clone_lib="Rice green shoot"
/note="Green shoot (8 days old)"
a 61 c 96 g 101 t
                                                                                                                                         Conservative:
Mismatches:
Indels:
                                                                                                        Length:
Matches:
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BF942509.1 GI:12359829
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105.50
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SWOVL2CAS01E04SK Onchocerca volvulus L2 larvae cDNA (SAW98MLW-OvL2) Onchocerca volvulus cDNA clone SWOVL2CAS01E04 5', mRNA sequence. A1363592.1 GI:4115213
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Eukaryota; Metazoa; Nematoda; Chromadorea; Spirurida; Filarioidea; Orchocercidae; Onchocercidae; Onchocercidae; Onchocercidae; Onchocercidae; Naturiaes 1 to 423)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Contact: Steven A. Williams
Molecular Parasitology
Smith College Department of Biological Sciences
Department of Biological Sciences, Clark Science Center, Smith
College, Northampton, MA, 01063, USA
Tel: 4135853826
                                                                                                                                     ....---HisTyr-SerGlyAlaSerValGlnAlaAspPheAspArgLeuGlnGlyAs 285
                                                                                                                                                                                                        285 pArgValProValLysValSerValThrGluValLysArgHisLysLeuGluThrGlyIl 305
                                                                                                                                                                                                                              eArgLeuAspSerGluTyrGlyLeuGlyGlyLysIleAlaTyrAspTyrTyrAsnLeuPh 325
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                              TTGAAAGAAGCCAATTTGCATTCGGCACCTCTGCAGTTTGCTCTGTACTGTTCTCTGGAT 537
                                                                                       GTCAGGCCACACTACTGCTGGCTCTGCTGATCAGCTTCC---AAAAAGAAAAAATTCA
                                                                                                                                                                                                                                                                                                                                                  eAsnLysGlyTyrIleGlySerValValTrpAspMetAspLysTyrGluThrThrLeuAl
                                                                   -----AspLeuLeuLeuAspPheGlnGlnAlaLeuGluGlnAsnGly----
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/organism="Onchocerca volvulus"
/db_rref="taxon:6282"
/clone="sWOvL2CAS01E04"
/clone_lib="Onchocerca volvulus L2 larvae cDNA
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--ThrProTyrAspLeu-
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Location/Qualiflers
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Email: genome@smith.edu
                                                                                                                                                                                                                                                                                                                                                                                                                                                        775 TGCAGGAGAAGGCTGCCC 793
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/tissue_type="embryo, stage 17/19"
/tissue_type="embryo, stage 17/19"
/tisb_bost="PHIOB (phage-resistant)"
/note="Vector: pCMV-SPORT6; Site_1: NotI; Site_2: SalI;
/note="Vector: pCMV-SPORT6; Site_1: NotI; Site_2: SalI;
cloned unidirectionally. Primer: Oligo dT. Average insert
size 2.1 kb. Constructed by Life Technologies."

207 c 243 g 222 t
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CDNA Library Preparation: Life Technologies, Inc.
CDNA Library Arrayed by: The I.M. A.G.E. Consortium (LLNL)
DNA Sequencing by: Agencourt Bioscience Corporation
Clone distribution: MGC clone distribution information can
found through the I.M. A.G.E. Consortium/LLNL at:
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Plate: LLAM10804 row: i column: 19
High quality sequence stop: 605.
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/db_xref="taxon:8355"
/clone="IMAGE:4888026"
                                                 Email: cgapbs-r@mail.nih.gov
Tissue Procurement: Dr. Igor Dawid
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                                Contact: Robert Strausberg, Ph.D.
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Adachi.J., Anizawa, K., Akhira, S., Akhmura, T., Aono, H., Aral, A., Arakawa, T., Baldarelli, R., Bono, H., Brownstein, M., Bult, C., Carninci, P., Fukuda, S., Fukunishi, Y., Furuno, M., Hanagaki, T., Hara, A., Hayatsu, N., Hill, D., Hiramoto, K., Hirawa, T., Hori, F., Hume, D., Imotani, K., Ishii, Y., Itoh, M., Izawa, M., Koya, T., Hori, F., Kuto, H., Kawai, J., Kojima, Y., Kouda, M., Koya, S., T., Kato, H., Kawai, J., Kojima, Y., Rouda, M., Koya, S., T., Kurihara, C., Matsuyama, T., Miyazaki, Y., Owa, C., Quackenbush, S., Saito, H., Saito, H., Sakai, Y., Shibata, Y., Shibata, Y., Shibata, Y., Shibata, Y., Shinagawa, A., Shiraki, T., Sogabe, Y., Suzuki, H., Tagami, M., Tagawa, A., Takahashi, F., Tanaka, T., Tajima, Y., Toya, T., Yamamura, T., Yamanaka, I., Yasunishi, A., Yoshida, K., Yoshino, M., Muramatsu, M. and Hayashizaki, Y.

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                                               Kawal, J., Shinagawa, A., Shibata, K., Yoshino, M., Itch, M., Ishil, Y.,
Arakawa, T., Hara, A., Fukunishi, Y., Konno, H., Adachi, J., Fukuda, S.,
Alzawa, K., Izawa, M., Nishi, K., Kiyosawa, H., Kondo, S., Yamanaka, I.,
Saito, T., Okazaki, Y., Gojobori, T., Bono, H., Kasukawa, T., Saito, R.,
Kadota, K., Matsuda, H., Ashburner, M., Batalov, S., Casavant, T.,
Fleischman, W., Gasterland, T., (Gissi, C., King, B., Kochiwa, H.,
Kuehl, P., Lewis, S., Matsuo, Y., Nichia, B., Kochiwa, H.,
Wagner, L., Washio, T., Sakai, K., Okido, T., Furuno, M., Aono, H.,
Baldarelli, R., Barshio, T., Sakai, K., Okido, T., Furuno, M., Aono, H.,
Baldarelli, R., Barshio, G., Blake, J., Boffelli, D., Bolinga, N.,
Fletcher, C., Fujita, M., Gariboldi, M., Gustinoich, S., Hill, D.,
Hofmann, M., Hume, D.A., Kamiya, M., Lee, N. H., Lyons, P.,
Narchionni, L., Mashima, J., Mazzarelli, J., Mombaerts, P., Nordone, P.,
Ring, B., Ringwald, M., Rodriguez, I., Sakamoto, N., Sasaki, H.,
Sato, K., Schonbach, C., Seya, T., Shibata, Y., Storch, K., Suzuki, H.,
Toyo-oka, K., Wang, K. H., Weltz, C., Whittaker, C., Willming, L.,
And Lassach, L., Vashida, K., Hasegawa, Y., Kawaji, H., Kohtsuki, S.
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Division of Experimental Animal Research in Riken contributed to prepare mouse tissues. First strand cDNA was primed with a primer [5' AGAGAGAGAGACAGCTTTTTTTTTTTTTTYN 3'), CDNA was prepared by using trehalose thermo-activated reverse transcriptase and subsequently enriched for full-length by cap-trapper. CDNA went trough one round of normalization to Rot = 7.5 and subtraction to established to sequence [5').
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Functional annotation of a full-length mouse cDNA collection
Nature 409 (6821), 685-690 (2001)
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Mammalia; Eutheria; Rodentia; Sciurognathi; Muridae; Murinae; Mus.
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HTC: CAP trapper.
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High-efficiency full-length cDNA cloning
Meth. Enzymol. 303, 19-44 (1999)
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                                                                                   ransformed mouse 3T3 cell double minute 1."
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Matches:
Conservative:
Mismatches:
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                                                                                                       /protein_id="BAB27830.1"
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Best Local Similarity:
Query Match:
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1130 GCTCCGAGAAAAGGCCGAATCTTACAGGAAGCGAGTTCAGGGGACACATTTTTCTCGGGA 1189
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                                                                                                                                                                                                                                                                                                                                                                          rGlyIleArgLeuAspSerGluTyrGlyLeuGlyGlyLysIleAlaTyrAspTyrTyrAs 323
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--- AspPheGlnGlnAlaLeuGlu-- 265
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                                                                                                                                                            ------CTTCGTAAGAAAGCTGGATTGGCC-----GTTGTTCCCACGAATAATGC
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                                                                                                                        ----GlnAsnGlyHisTyrSerGlyAlaSerValGlnAlaAspPheAspArgLeuGlnGl
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VERSION
KEYWORDS
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Mus muscatulus
Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Euteleostomi;
Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Euteleostomi;
Enamialia; Eutheria; Rodentia; Sciurognathi; Muridae; Murinae; Muscati to 1031)

National Institutes of Health, Mammalian Gene Collection (MGC)
Inpublished (1999)
Contact: Robert Strausberg, Ph.D.
Contact: Robert Strausberg, Ph.D.
Contact: Robert Strausberg, L. Sullivan, PhD.
CONTACT: Robert Strausberg, Ph.D.
Contact: Robert Strausbe
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unidirectionally. Primer: Oligo dT. Average insert size
2.2 kb. Constructed by ResGen, Invitrogen Corp. Note: this
is a NIH_MGC_Library."
2.40 c 294 g 246 t 2 others
                                                               BQ876247 1031 bp mRNA 11near EST 16-AUG-2002
AGENCOURT_8742755 NIH_MGC_129 MUS musculus cDNA clone 1MAGE:6391121
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       found through the I.M.A.G.E. Consortium/LLNL at: http://image.llnl.gov plate: LLAM13878 row: n column: 18 High quality sequence start: 103 High quality sequence stop: 510.
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TITLE
JOURNAL
COMMENT
             RESULT 18
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//organism="Vitis vinifera"
/do_reref="taxon:29760"
//clone_lib="An expressed sequence tag database for abiotic stressed leaves of Vitis vinifera var. Chardonnay"
/tissue_type="leaf"
/dov_stage="luvenile and adult"
/note="Vector: Lambda Uni-zap XR, Bluescript SK-; Site_1: EcoRI: Site_2: Xhoi; Library construction was performed according to Stratagene's recommended protocol for the Lambda UnizapXR vector and cDNA synthesis kit."
92 a 89 c 120 g 150 t
Vitis vinifera.

Nutis vinifera

Eukaryota: Viridiplantae: Streptophyta; Embryophyta; Tracheophyta; Spermatophyta: Magnoliophyta; Eudicotyledons; core eudicots; Vitaceae; Vitis.

I (bases 1 to 451)

S Gramer, G.R. and Cushman, J.C.

An expressed sequence tag database for abiotic stressed leaves of Vitis vinifera var. Chardonnay

L Unpublished (2002)

Contact: Cushman JC

Department of Biochemistry
University of Nevada
MS200, Reno, NV 89557-0014, USA
Tel: 775-784-1650
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14 9 912 t 5 others
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p. cremoris
actobacillales; Streptococcaceae;

    and Sorokin, A.
    bairy bacteria Lactococcus lactis
    In press

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### SOURCE  ### SO		pSerTrpGluAsnSerLysThrSerValLeuGlyAlaValThr 187	SOURCE ORGANISM	Lactuca sativa. Lactuca sativa Fukarvota: Viri
18				Y CALVOLA: V
188		NIGCTGGTCAAAACATCAAAGATTTTGGCTGGAATCGATACTGTTCGTCCATTC ZUU		Spermatophyta;
208 AlathrvalAspleusanvalValValSepGCGIyArgPcolleAlatheGiyAspPhe 227  228 GluileThrGlyThrGlaArgYprocluGlaile		ProLeuAlaLysLeuGlyAsnThrArgAlaAlaValAsnProAspThr             	REFERENCE	ຸ ທຸ
1968		LeuAsnvalValvalaspSerGlyArgProIleAlaPheGlyAspPhe		Lin, H., van Dam , P., Kolkman, J.
228 Glutlerhrcitythrcinatgytyprocludinile		19	TITLE	Church, S., Jack Lettuce and Sun
1956 CGTACAACAGCTACATCTAGACCTTTGAAGACCTTTGAAGACCAACTT 1897   24.0			JOURNAL	http://compgenom Unpublished (20 Contact: Alexan
242 GIPJERAIDARGPHEGINPTOCITYTRSPLEAUEAULEUUSPHEGIN 261  1896 ACTTGGCTGGCTTGACTGGGTTTGCGTTGTTGAAGATAAACAT 1840  262 GINAIALEUGIUGINASGIGGGTTTGGTTGAAGATAAACAT 1840  262 GINAIALEUGIUGINASGIGGGTTTGGTTGAAGATAACATTGCGGGC 783  282 LEUGINGIYASPATGCTGGGCANAAACGATGATGAACATTGCGGGC 783  282 LEUGINGIYASPATGCTGGCCANAAACGATGATGAACATTGATGATGATGATGATGATGATGATGATGATGATGATG				Department of V
1896 ACTITGGCTGGTTTGGCTGTTGGTTGTTGTTGTTGTTGTAGATAAACAT 1840  262 GIAAATCATTGATGCTTGTGTTGTTGTTGTTGTTGTTGTTGTTGTTGTTGTT	242	eualaargPheGlnProGlyThrProTyraspLeuaspLeuLeuLeuAspPheGln 	· · · · ·	Asmundson Hall, Tel: 1-(530)-74
262 GIANALGEMEGICALINASNGLYHISTYSERGLYALGENALARAPPHARPARY 281  1839 GARATCATIGATOGT GCGCATARACCCTACACAACAATCCCTCGC 1783  282 LeuGInGlyAspargValProValLysValSerValThrGluValLysArgHisLysLeu 301  1782	1896	TGGCTGGTTTGACTGTGGGTATCGCTGATATTCCTGTTGTTGAAGATAAACAT		Fax: 1-(530) Email: akozi
1839 GAAATCATGATGCTGGCCATAAACGCGTAGAACACTAAACATTCGTCGC 1783 FEATURES	262	GInAlaLeuGluGlnAsnGlyH1sTyrSerGlyAlaSerValGlnAlaAspPheAspArg		belongs to cont for details.
282 LeuGlnGlyAspArgValProValLysValSerValThrGluValLysArgHisLysLeu 301  1782	1839	GAAATCATTGATGCTGCGCATAAACGCGTAGAACACATCACTAAACAATTCCGTCGC 178	FFATIIRES	Plate: QGI16 r
1782	282	InGlyAspArgValProValLysValSerValThrGluValLysArgHisLysLeu	source	
302 GluthrGlyIleArgLeuAspSerGlutyrGlyLeuGlyGlyLysIleAlaTyrAspTyr 321				no/
1749   GTTACTCGGGTGTTGTGTGTGTGTGTGTGTGTGTGTGTGT		hrGlylleArgLeuAspSerGluTyrGlyLeuGlyGlyLyslleAlaTyrAspTyr		/clone
322 TyrAsnLeuPheAsnLysGlyTyrIleGlySerValValTrpAspMetAspLysTyrGlu 341  1692CAAGAATTGACAAA		:: 		/crone /lab_h /rotor
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342 ThrThrLeuAlaAlaGlyIleSerGlnProArgAsnTyrArgGlyAsnTyrTrpThrSer 361  1647 CGTGGTAATATTCCAACTTGCTGGTATGCGTGGATTGATGGTGCTCCT 1588  362 ASn	1692	AAGAATTTGACAAACCCATCGTTATGATGATGACTCTGAAGCC		incorp
1647   CGTGGTAATATTTCCAACTTGCTGGTATGGTGGTTGTGTTGTTGTTGTTGTTGTTGTTGTTG	342	ThrThrLeuAlaAlaGlyIleSerGlnProArgAsnTyrArgGlyAsnTyrTrpThrSer		direct
362 Asn		GTAATATTTCCAACTTCTTCAACTTGCTGGTATGCGTGGATTGATGGCTGCTCCT		size b
1587 AATGGTAAAATCATGGTAACTTCGTGAAGGCCTTTCTGTTG 1528  374 Glu				TAG_LI
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1527 GAATGTTCTCCACTCCGTAAGGCCCCATAGGCA 1468  377 AlaPheSerGlyGlyIleTrpTyrValArgAspargalaGlyIleAspala 393  11		LysArg	ORIGIN	)
377 AlaPheSerClyGlyIleTrpTyrValArgAspArgAlaGlyIleAspAla 393	Н		Alignment Scores	cores:
1467 GCCGACTCAGGTTAACCTTACTTGGTTGTTGCTTGCCCAAGATGTT 1417  394 ArgLeuGlyAlaGluPheLeuAlaGluGlyArgLySIleProGlySerAspIleAspLeu 413  315 ArgLeuGlyAlaGluPheLeuAlaGluGlyArgLySIleProGlySerAspIleAspLeu 413  316 ArgLeuGlyAlaGluPheLeuAlaGluGlyArgLySIleProGlySerAspIleAspLeu 413  317 Bast Local Query Matc Date of Match Matc		AspAla	Score:	4
394 ArgLeuGlyAlaGluPheLeuAlaGluGlyArgLysIleProGlySerAspIleAspLeu 413  :::   1416 ATCATTCGTGAAAAGGACTGTGACTGAAATGCTGATATTGCAACT 1357  414 GlyAsnSerHisAlaThrMetLeuThrAlaSerTrpLysArgGlnLeu		TACCTTACTCGTTGGTTGTCGTTGCCCAAGATGTT	Best Local	Percent Similarity: Best Local Similarity:
1416 ATCATCGTGAAAAGGACTGTGGTACTGACGTGACTTGTGATTGCTGATATGCAACT 1357  414 GlyAsnSerHisAlaThrMetLeuThrAlaSerTrpLysArgGlnLeu			Query match DB:	::
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			26	LeuSerGluAsnLysAl
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444 Qy 46		snAsnValLeuHisProGluAsnGlyHisTyrLeuAspGly	46	SerValLysLeuLysPr
Db 1305 CGTAAATCAGCTCCTTCATCCAGAAACTGGTGAAATGATTATTGGC 1261	1305	CGTAAATCAGTCCTTCATCCAGAAACTGGTGAAATGATTATTGGC	54	TCAGCCAGC
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Lone (2016M16

Lone 11b = "05_ABDI lettuce salinas"

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itig QG_CA_Contig6253, see http://cgpdb.ucdavis.edu/
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Vegetable Crops, R.W.Michelmore Lab
California at Davis (UCD)
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bp mRNA linear EST 20-FEB-2002
Homo sapiens cDNA clone IMAGE:5432221
incorporated unique 5' and 3' tags to distinguish each source of RNA. cDNAs were then pooled, size-fractionated, directionally cloned into a custom medium-copy vector and transformations made with four size classes to minimize size bias. Details of each source of RNA and library construction can be obtained at http://cgpdb.ucdavis.edu/TAG_LIB-GG_ABCDI lettuce salinas
TAG_LIB-GG_ABCDI lettuce salinas
TAG_TISSUE-flowers pre-fertilized
TAG_TISSUE-flowers pre-fertilized
a l16 c l29 g l62 t
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KEYWORDS EST.  SOURCE human.  ORGANISM Homo sapiens  ENARTYOR Wetazoa; Chordata; Craniata; Vertebrata; Euteleostomi;  Mammalia; Eutheria; Primates; Catarrhini; Hominidae; Homo.  AUTHORS NIH MGC http://mgc.ncl.nih.gov/.  TITLE NATIONAL TARTITUDES OF Health Mammalian Gone Collection (MCC)	AL Unpublished (1999) Contact: Robert Strausberg, Ph.D. Email: cgapbs-rémail.nih.gov Tissue Procurement: ATCC CDNA Library Preparation: Rubin Laboratory CDNA Library Arrayed by: The I.M.A.G.E. Consortium (LINL DNA Sequencing by: Agencourt Blossience Corporation Clone distribution: MGC clone distribution information of Annal Health Health And Consortium (Linl	http://inage.lni.gov http://inage.lni.gov Plate: LiCM1905 row: 1 column: 14 High quality sequence stop: 532. Location/Qualifiers source /organism="homo sapiens" /clone="taxon: 9606" /clone="lib="NIH_MGE.5432221"	/Lisb_host="Data astroycycome grade 1v, cell line" /lab_host="Data astroycycome grade 1v, cell line" /note="Organ: brain; Vector: pOTB7; Site_1: XhoI; Site_2: /note="Organ: brain; Vector: pOTB7; Site_1: XhoI; Site_2: ECORI; CDNA made by oligo-dT priming. Directionally cloned into ECORI/XhoI sites using the following 5' adaptor: GGCACGAG(G). Library constructed by Ling Hong in the laboratory of Gerald M. Rubin (University of California, Berkeley) using ZAP-CDNA synthesis kit (Stratagene) and Superscript II RT (Life Technologies).	BASE COUNT       213 a       448 c       325 g       185 t         ORIGIN       448 c       325 g       185 t         Alignment Scores:       0.876       Length:       1171         Score:       99.00       Matches:       64         Percent Similarity:       24.38       Conservative:       16         Best Local Similarity:       24.33       Mismatches:       64         Query Match:       3.124       Indels:       119	99-857-669-2 (1-609) x BM560625 (1-1171) 376 ArgalaPheSerGlyGlyIleTrpTyrValArgAspArgAlaGl :: ::	Qy         416 SerHisAlaThrMetLeuThrAlaSerTrpLySArgGlnLeuLeuAsnAsnValLeuHis 435           Db         1018           Qy         436 ProGluAsnGlyHisTyrLeuAspGlyLySIleGlyThrThrLeuGlyThrPheLeuSer 455           L         111           III         IIII           III         IIII           III         IIII           III         IIII           III         IIII           III         IIII           Db         990           III         IIII

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1. .994

/organism="Mus musculus"
/strain="FVB/N"
/db_xref="taxon:10090"
/clone="IMAGE:4193306"
/clone=lib="NCI_CGAP_SG2"
/lab_host="HHIOB (TI phage resistant)"
/note="Organ: salivary gland; Vector: pCMV-SPORT6; Site_1: Not1: Site_2: Sali (Joned unidirectionally. Primer: Oligo dT. Average insert size 1.3 kb. Constructed by Life
Technologies. Note: this is a NCI_CGAP Library."
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NIH-MGC http://mgc.nci.nih.gov/.
National Institutes of Health, Mammalian Gene Collection (MGC)
Unpublished (1999)
                                                                                                                                                                                                            Contact: Robert Strausberg, Ph.D.
Email: cgapbs-remail.nih.gov
Tissue Procurement: Jeffrey E. Green, M.D.
CDNA Library Preparation: Life Technologies, Inc.
CDNA Library Preparation: Life Technologies, Inc.
CDNA Library Arrayed by: The I.M.A.G.E. Consortium (LLNL)
DNA Sequencing by: Incyte Genomics, Inc.
Clone distribution: MGC clone distribution information can be found through the I.M.A.G.E. Consortium/LLNL at:
http://image.lln.gov
Plate: LLAM9525 row: g column: 03
High quality sequence stop: 656.
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                    Separate cDNAs were generated using primers that incorporated unique 5' and 3' tags to distinguish each source of RNA. CDNAs were then pooled, size-fractionated directionally cloned into a custom medium-copy vector and transformations made with four size classes to minimize size bias. Details of each source of RNA and library rocintuction can be obtained at http://cgpdb.ucdavis.edu/TAG_LIR=vG_ABCDI lettuce salinas
TAG_LIR=vG_ABCDI lettuce salinas
TAG_CEG_CCTTGACGGG
        genotype
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from 10 different sources of RNA from a single
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                                                          Clone distribution: MGC clone distribution information can be four through the I.M.A.G.E. Consortium/LLNL at: http://image.llnl.gov Series: IRAR Plate: 71 Row: j Column: 2 This clone was selected for full length sequencing because it passed the following, selection criteria: Hexamer frequency ORF analysis. Similarity but not identity to protein This clone has the following problem: no 5' EST match. Location/Qualifiers
Yoon, V.S., Kowis, C.R., Lawrence, S., Martin, R.G., Muzny, D.M. Richards, S., Gibbs, R.A.
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1372 TCAAATGCTGCTCATGGAAGATCCAAATCCGCTAATGATGATGGAAACTGGCCAACATTAAAA
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132 CAGAATTCTAGCTCTTCCGTGAAACCAGTGCAGGTGGCCGGTGCAGACTGGAAGGATCCG
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/db_xref="taxon:9606"
/clone="IMAGE:4824450"
/tissue_type="Testis"
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/lab_host="DH10B"
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Strausberg, R.
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Submitted (31-JUL-2002) National Institutes of Health, Mammalian
Gene Collection (MGC), Cancer Genomics Office, National Cancer
Institute, 31 Center Drive, Room 11A03, Bethesda, MD 20892-2590,
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Center code: BCM-HGSC
Web site: http://www.hgsc.bcm.tmc.edu/cdna/
Contact: amg@bcm.tmc.edu
Gunaratne, P.H., Garcia, A.M., Lu, X., Hulyk, S.W., Hale, S.M.,
                                                                   377 aPheSerGlyGlyIleTrpTyrValArgAspArgAlaGlyIle-----As 392
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                                                                                                                                                                                                                                                                                                                                                                                        318 AlaTyrAspTyrTyr-AsnLeuPheAsnLysGlyTyrIleGlySerValValTrpAspMe 337
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------GGCTTGTCGGAT---GAACTGGCTAAACTGGATGCATTTGTAGAAGGTGTG 364
                                                                                                                           260 PheGlnGlnAlaLeuGluGlnAsnGlyHisTyrSerGlyAlaSerValGlnAlaAspPhe
                                                                                                                                                                                                                                         240 ValSerGlyLeuAlaArgPheGlnProGlyThrProTyrAspLeuAspLeuLeuLeuAsp
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BQ479447 690 bp mRNA linear EST 03-JUN-2002 ku36h01.yl Strongyloides ratti PA female nalve SL1 TOPO vl Strongyloides ratti cDNA similar to SW:YMT1_CABEL P98080 HYPOTHEFICAL 51.7 KD PROTEIN F56D2.1 IN CHROMOSOME III. [1] ;, mRNA
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                                                                                                                                                                                                                                                                                                                                                               126 IleThrProGlyProArgThrLysIleAlaAsnValGlyValAlaIleLeuGlyAspIle 145
                                                                                                                                                                                                                                                                                                                                                                                             146 LeuSerAspGlyAsnLeuAlaGluTyrTyrArgAsnAlaLeuGluAsnTrpGlnGlnPro 165
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TAG_LIB-QC_ABCDI lettuce salinas
                                                                                                                   mRNA linear EST 15-AUG-2002 salinas Lactuca sativa cDNA clone
                                                                                                                                                                                                                                                                                                                                                                                                                                Kozik, A., Michelmore, R.W., Knapp, S., Matvienko, M., Rieseberg, L., Lin H., van Damme, M., Lavelle, D., Chevalier, P., Ziegle, J., Ellison, P., Kolkman, J., Slabaudh, M.S., Livingston, K., Zhou, Y., Lai, Z., Church, S., Jackson, L. and Bradford, K., Lettuce and Sufflower ESTs from the Compositae Genome Project http://compgenomics.ucdavis.edu/
                                                                                                                                                                                                                                                                                      Lactuca sativa
Eukaryota; Viridiplantae; Streptophyta; Embryophyta; Tracheophyta;
Spermatophyta; Magnoliophyta; eudicotyledons; core eudicots;
Asteridae; euasterids II; Asterales; Asteraceae; Lactuceae;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Contact: Alexander Kozik [R.W.Michelmore]
Department of Vegetable Crops, R.W.Michelmore Lab
Diversity of California at Davis (UCD)
Asmundson Hall, UCD, Davis, CA 95616, USA
Tel: 1-(530)-742-1742
Fax: 1-(530)-752-9659
Fax: 1-(530)-752-9659
Dealings to contig QG_CA_Contig6253, see http://cgpdb.ucdavis.edu/
for details.
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/lab_host="E.coli"
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                                                                                                           OGII2317.79.abl QG_ABCDI lettuce . QGI12317, mRNA sequence.
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Location/Qualifiers
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VERSION
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                                                                                                                                          DEFINITION
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                                                                   RESULT 26
BQ871709
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AUTHORS
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Email: est@watson.wustl.edu
The library was constructed by Claire Murphy and Dr. James McCarter
at Washington University, St. Louis. Parasitic adult females were
collected from naive animals and provided by Dr. Mark Viney of The Washington Univ. Nematode EST Project, 1999
Unpublished (1999)
Contact: McCarter 1999
The Washington Univ. Nematode EST Project, 1999
Washington University School of Medicine
Hashington University School of Medicine
Tel: 314 286 1810
Fax: 314 286 1810

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source
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ORIGIN
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AUTHORS
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KEYWORDS
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                                                                                /organism="Strongyloides ratti"
/db_xref="taxon:34506"
/clone_lib="Strongyloides ratti PA female naive SL1 TOPO
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             151 LeuAlaGluTyrTyrArgAsnAlaLeuGluAsnTrpGlnGlnProValGlySerAspPhe 170
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  193 TATGAAACTGAAGAAAATAATGGAGTTGCTAATTTAGTTGAACATCTTCTTCACAAAGGA 252
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               96 ProAspAsnValLysThrMetLeuArgSerLysGlyTyrPheSerSerLysValSerLeu 115
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  327
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   116 ThrGluLysAspGlyAlaTyrThrValHisIleThrProGlyProArgThrLysIleAla 135
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      328 AGAGAA------CATACTGCCTATTTTGCTCAAGCTCCATCAGGAAAAGTTGAA 375
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        136 AsnValGlyValAlaIleLeuGlyAspIleLeu-------SerAspGlyAsn 150
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   171 AspGlnAspSerTrpGluAsnSerLysThrSerValLeuGlyAlaValThrArgLysGly 190
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         37 PheLysAsnLysSerProAspThrGluSerValLysLeuLysProLysPheProVal--- 55
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           95
UK (Mark.Viney@bristol.ac.uk)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            75
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     57 IleAspThrGlnAspSerGlu---IleLysAspMetValGluGluHisLeuProLeuIle 75
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       18 HisAlaTyrAlaPro---AlaAlaAspLeuSerGluAsnLysAlaAlaGlyPheAlaLeu 36
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   274 -----CAATTAGAGACAGAATTAGGTAAGATTGGTGCTAGATTATCATCATGTAAGTAGT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         76 ThrGlnGlnGlnGluGluValLeuAspLySGluGlnThrGlyPheLeuAlaGluGluAla
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          253 ACTAACAAAAGATCACAAGTT------
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58
33
76
67
12
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Matches:
Conservative:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          46 CATGCATTTGCTCCAAATTCAGCTGATGTT-------
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Mismatches:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Indels:
Gaps:
Iniversity of Bristol, Bristol,
           Seq primer: SL1 primer
High quality sequence stop: 525.
Location/Qualifiers
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                                                                                                                                                          /dev_stage="adult"
/lab_host="DH108"
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38.89%
24.79%
3.04%
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Pred. No.:
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DB:
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Kozik.A., Michelmore,R.W., Knapp,S., Matvienko,M., Rieseberg,L.,
Lin,H., van Damme,M., Lavelle,D., Chevalier,P., Ziegle,J., Ellison
P., Kolkman,J., Slabaugh,M.S., Livingston,K., Zhou,Y., Lai,Z.,
Church,S., Jackson,L. and Bradford,K.
Lettuce and Sunflower ESTs from the Compositae Genome Project
http://compgenomics.ucdavis.edu/
unpublished (2002)
Contact: Alexander Kozik (R.W.Michelmore)
Department of Vegetable Crops, R.W.Michelmore Lab
University of California at Davis (UCD)
Asmundson Hall, UCD, Davis, CA 95616, USA
Tel: 1-(530)-742-1659
Email: akozik@atgc.org [michelmore@vegmail.ucdavis.edu]
belongs to contig OG_CA_Contig6253, see http://cgpdb.ucdavis.edu/
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         //note="Vector: Descriptions of RNA from a single genotype from 10 different sources of RNA from a single genotype. Separate cDNAs were generated using primers that incorporated unique 5' and 3' tags to distinguish each source of RNA. cDNAs were then pooled, size-fractionated, directionally cloned into a custom medium-copy vector and transformations made with four size classes to minimize size bias. Details of each source of RNA and library construction can be obtained at http://cgpdb.ucdavis.edu/7AG_LIB=OG_ABCDI lettuce salinas
TAG_LISCOE-flowers pre-fertilized
TAG_LISCOE-flowers 116 t
                                                                                                                                                                                                                                                                                                                                     577 bp mRNA linear EST 15-AUG-2002 lettuce salinas Lactuca sativa cDNA clone
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Lactuca sativa.
Lactuca sativa
Lactuca sativa
Eukaryota; Viridiplantae; Streptophyta; Embryophyta; Tracheophyta;
Spermatophyta; Magnollophyta; eudicotyledons; core eudicots;
Asteridae; euasterids II; Asterales; Asteraceae;
                                                                                                             535 ACACCATTGGCTAAGAGTATTTATGGAACTACAGAGACAATTCAAAATCTTTCACGTAAT 594
  --CTTCATGCTACAGCTTTCCAAGGA 534
                                                      191 TyrProLeuAlaLys....-LeuGlyAsnThrArgAlaAlaValAsnProAspThrAla
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    /db_xref="taxon:4236"
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45
42
88
44
                                                                                                                                                                                           595 GATGTT---CTTAATTTTATTGATGATCATTACAAACCTGTT 633
                                                                                                                                                                    209 ThrValAspLeuAsnValValValAspSerGlyArgProIle 222
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Matches:
Conservative:
Mismatches:
Indels:

    577
/organism="Lactuca sativa"
/cultivar="Salinas"

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Location/Qualifiers
490 CAAGAGGTAGTTTTGATAAC-----
                                                                                                                                                                                                                                                                                                                                                               QGI16A10.yg.abl QG_ABCDI
QGI16A10, mRNA sequence.
                                                                                                                                                                                                                                                                                                                                                                                                                      BO872562
BO872562.1 GI:22259121
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39.73%
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Best Local Similarity:
Query Match:
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//ncte="Vector: pBRCDNASfiAB; The library was constructed from 10 different sources of RNA from a single genotype. Separate cDNAs were generated using primers that incorporated unique 5' and 3' tags to distinguish each source of RNA. cDNAs were then pooled, size-fractionated, directionally cloned into a custom medium-copy vector and transformations made with four size classes to minimize size bias. Details of each source of RNA and library construction can be obtained at http://cgpdb.ucdavis.edu/TAG_LIB-GG_ABCDI lettuce salinas
TAG_LIB-GG_ABCDI lettuce salinas
TAG_LIB-GG_ABCDI lettuce salinas
TAG_LISUUE-flowers pre-fertilized
TAG_SEC_GGTAGAGGGG"

12 a 121 c 136 g 180 t 1 others
                       Email: akozik@atgc.org [michelmore@vegmail.ucdavis.edu]
belongs to contig QG_CA_Contig6253, see http://cgpdb.ucdavis.edu/
for details.
Plate: QG16 row: O column: 20.
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             106 LysGlyTyrPheSerSerLysValSerLeuThrGluLysAspGlyAlaTyrThrValHis 125
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         126 IleThrProGlyProArgThrLysIleAlaAsnValGlyValAlaIleLeuGlyAspIle 145
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           LeuSerAspGlyAsnLeuAlaGluTyrTyrArgAsnAlaLeuGluAsnTrpGlnGlnPro 165
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        CCAATTGTTGGGAATGCAGCAGAA-----TCTATTATTACAACACAAACAGAC 362
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       66 AspMetValGluGluHisLeuProLeuIleThrGlnGlnGlnGluGluValLeuAspLys ·85
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         SerValLysLeuLysProLysPheProValArgIleAspThrGlnAspSerGluIleLys
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  54 TCAGCCAGC------CAAGCTTTAGACACAAAATCT-----
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                                                                                                                                                                                                                       /clone="QGI6020"
/clone="QGI6020"
/clone="QGI6020"
/clone=lib="QGABGDI lettuce salinas"
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446
96
30
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Mismatches:
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                                                                                                                                               Location/Qualifiers
                                                                                                                                                                                                                                                                                                                                                 /lab_host-"E.coli"
  Fax: 1-(530)-752-9659
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96.00
40.57%
21.70%
3.03%
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Best Local Similarity:
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Asteridae; euasterids II; Asterales; Asteraceae; Lactuceae;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    126 IleThrProGlyProArgThrLysIleAlaAsnValGlyValAlaIleLeuGlyAspIle 145
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            AlaVal---ThrArgLysGlyTyrProLeuAlaLysLeuGlyAsnThrArgAlaAlaVal 203
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-----GCAAACAAAATCATTGAAAAAGGTTCTGATTCTGTC 506
                                                                                                                                                                                                                                                                                                                                              87 -----GTTGTTGGTAGTATTCCAATCATTGGTGATACAGCTCAATCCATCATCACCAAA 140
                                                                                                                                                                                                                                                                                                                                                                                                    86 GluGlnThrGlyPheLeuAlaGluGluAlaProAspAsnValLySThrMetLeuArgSer 105
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         146 LeuSerAspGlyAsnLeuAlaGluTyrTyrArgAsnAlaLeuGluAsnTrpGlnGlnPro 165
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       ValGlySerAspPheAspGlnAspSerTrpGluAsn---SerLysThrSerValLeuGly 184
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                ATGGCTAGTGATGCGGTTGAAAGCTCAACTTCGTCGGTCAAGAAGCATGGTTTATTAGGA 422
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                                                                                                                                                                                                                                                                                        85
                                                        LeuSerGluAsnLysAlaAlaGlyPheAlaLeuPheLysAsnLysSerProAspThrGlu 45
                                                                                               ------ArgProlleAlaPheGlyAspPheGlulleThrGlyThr 232
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        141 CAAACTGAC-----ATGGCAAATCAATTGATTGATACCACGACTTCTTCTGTCAAGGAG
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                                                                                                                                                                       SerValLysLeuLysProLysPheProValArgIleAspThrGlnAspSerGluIleLys
                                                                                                                                                                                                                                                                                        66 AspMetValGluGluHisLeuProLeuIleThrGlnGlnGlnGluGluValLeuAspLys
                                                                                                                                                                                                                                54 TCAGCCAGC-----CAAGCTTTAGACACAAAATCT-----
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Department of Vegetable Crops, R.W.Michelmore I
University of California at Davis (UCD)
Manudson Hall, UCD, Davis, CA 95616, USA
Tel: 1-(530)-742-1742
US-09-857-669-2 (1-609) x BQ872562 (1-577)
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TAG_LISUE=flowers pre-fertilized
TAG_LSC=Flowers pre-fertilized
TAG_LSC=CTTGACGGGG.

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                                                                                                                                                                                                                                                     OGI6P11.99.abl QG_ABCD1 lettuce salinas Lactuca sativa cDNA clone QGI6P11, mRNA sequence.
BQ875030
BQ875030.1 GI:22261590
EST.
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(Cases 1 to 
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Spermatophyta; Magnoliophyta; eudicotyledons; core eudicots;
Asteridae; euasterids II; Asterales; Asteraceae; Lactuceae;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Department of Vegetable Crops, R.W.Michelmore Lab University of California at Davis (UCD) Asmundson Hall, UCD, Davis, CA 95616, USA Fel: 1-(530)-742-1742 Fax: 1-(530)-752-9659 Fax: 1-(530)-752-9659 Fax: belongs to contig QG_CA_Contig6253, see http://cgpdb.ucdavis.edu/for details.
------AsnProAspThrAlaThrValAspLeuAsnValValValAspSerGlyArg 220
                                                        483 ATTGAAAAAGGTTCTGATTCTGTCGAAAAACCCTAGAGAANACCACATCCAGC-----
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/lab_host="E.coli"
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/organism="Lactuca sativa"
/cultivar="Salinas"
/db_xref="taxon:4236"
/clone="QG16P11"
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204
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LOCUS
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BQ874536 731 bp mRNA linear EST 15-AUG-2002 QGI5M18.yg.abl QG_ABCDI lettuce salinas Lactuca sativa cDNA clone QGI5M18, mRNA sequence.
BQ874536.1 GI:22261177
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Lactuca sativa
Lactuca sativa
Sukaryota, Viridiplantae, Streptophyta, Embryophyta, Tracheophyta,
Spermatophyta, Magnoliophyta, eudicotyledons, core eudicots,
Asteridae, euasterids II, Asterales, Asteraceae, Lactuceae,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         315 CCAATTGTTGGGAATGCAGAGAA------TCTATTATTACAACACAAACAGAC 362
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                                                                                                                                                                                                                                                                                                                                                                                                                                                     86 GluGlnThrGlyPheLeuAlaGluGluAlaProAspAsnValLysThrMetLeuArgSer 105
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    106 LysGlyTyrPheSerSerLysValSerLeuThrGluLysAspGlyAlaTyrThrValH1s 125
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   255 ATGGGTTCTGATTCAGCTAGCCAAGCATTAGAAACAACCAAGTCGGTTGTCGGAGGTATC 314
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              146 LeuSerAspGlyAsnLeuAlaGluTyrTyrArgAsnAlaLeuGluAsnTrpGlnGlnPro 165
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                166 ValGlySerAspPheAspGlnAspSerTrpGluAsn---SerLysThrSerValLeuGly 184
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      185 AlaVal---ThrArgLysGlyTyrProLeuAlaLysLeuGlyAsnThrArgAlaAlaVal 203
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                                                                                                                                             46 SerValLysLeuLysProLysPheProValArgIleAspThrGlnAspSerGluIleLys 65
                                                                                                                                                                                                                        507 GAAAAAACCCTAGAGAAAACCACATCCAGCATTGGAGATATCCCAATTCTAGGATCT 563
                                                                  3 GTAAACGAGGCACAAGCAACAGGTACATCCATCCAAAAG------GGTACTGAG
26 LeuSerGluAsnLysAlaAlaGlyPheAlaLeuPheLysAsnLysSerProAspThrGlu
                                                                                                                                                                                                                                                                                                       66 AspMetValGluGluHisLeuProLeuIleThrGlnGlnGluGluGluValLeuAspLys
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Unpublished (2002)
Contact: Alexander Kozik [R.W.Michelmore]
Department of Vegetable Crops, R.W. Michelmore Lab
University of California at Davis (UCD)
Asmundson Hall, UCD, Davis, CA 95616, USA
Tel: 1-(530)-752-1742
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200 ArgAlaAlaValAsnProAspThrAlaThrValAspLeuAsnValValValAspSerGly
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                                                                                                                                                                                                                                                                                                             BQ850925.1 GI:22236394
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96.00
40.57%
21.70%
3.03%
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Best Local Similarity:
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BQ850925
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AUTHORS
                                          471
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TAG_LIB-GC_ABCDI lettuce salinas
TAG_SEQ=CCTTGAGGGG.
TAG_SEQ=CCTTGAGGGG.
Email: akozik@atgc.org [michelmore@vegmail.ucdavis.edu] belongs to contig QG_CA_Contig6253, see http://cgpdb.ucdavis.edu/ for details. Plate: QGIS row: M column: 18.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     105
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47
43
81
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Mismatches:
Indels:
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Matches:
                                                                                                       /organism="Lactuca sativa"/cultivar="Salinas"
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                                                      Location/Qualifiers
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40.36%
21.08%
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1. 735
/organism="Lactuca sativa"
/cultivar="Salinas"
/db_xref="taxon:4236"
/clone="QGB13024"
/clone="DGB13024"
/clone="Lib="QG_ABCDI lettuce salinas"
/lab_host="Ecoli"
/lab_host="Ecoli"
/lab_host="Ecoli"
/lab_host="coli"
/note="Vector: pBRCDNASfiAB; The library was constructed from 10 different sources of RNA from a single genotype. Separate cDNAs were generated using primers that incorporated unique 5' and 3' tags to distinguish each source of RNA. cDNAs were then pooled, size-fractionated, directionally cloned into a custom medium-copy vector and transformations made with four size classes to minimize size bias. Details of each source of RNA and library construction can be obtained at http://cgpdb.ucdavis.edu/TAG_LIB=QG_ABCDI lettuce salinas
TAG_LIB=QG_ABCDI lettuce salinas
TAG_LIB=QC_ABCDI lettuce salinas
TAG_LISUE-flowers pre-fertilized
TAG_LISUE-flowers pre-fertilized
                                                                                                                                                                                                                                                                                                                                                                  DUGDOUYZD 735 bp mRNA linear EST 14-AUG-2002 QCB13024.yg.abl QC_ABCDI lettuce salinas Lactuca sativa cDNA clone QCB13024, mRNA sequence.
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Kozik.A., Michelmore,R.W., Knapp,S., Matvienko,M., Rieseberg,L.,
Lin,H., van Damme,M., Lavelle,D., Chevalier,P., Ziegle,J., Ellison
,P., Kolkman,J., Slabaugh,M.S., Livingston,K., Zhou,Y., Lai,Z.,
Church,S., Jackson,L. and Bradicord,R.
Lettuce and Sunflower ESTs from the Compositae Genome Project
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Eukaryota; Viridiplantae; Streptophyta; Embryophyta; Tracheophyta; Spermatophyta; Magnoliophyta; eudicotyledons; core eudicots; Asteridae; euasterids II; Asterales; Asteraceae; Lactuceae;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        http://compgenomics.ucdavis.edu/
Unpublished (2002)
Contact: Alexander Kozik [R.W.Michelmore]
Contact: Alexander Kozik [R.W.Michelmore Lab
Department of California at Davis (UCD)
Asmundson Hall, UCD, Davis, CA 95616, USA
Tell: 1-(530)-752-9659
Email: akozik@atgc.org [michelmore@vegmail.ucdavis.edu]
          494
                                                                                                               -----ArgProlleAlaPheGlyAspPheGluIle
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             735
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Matches:
Conservative:
Mismatches:
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/.uc. / vector: pBRCDNASfiAB; The library was constructed from 10 different sources of RNA from a single genotype. Separate CDNAS were generated using primers that incorporated unique 5' and 3' tags to distinguish each source of RNA. cDNAS were then pooled, size-fractionated, directionally cloned into a custom medium-roopy vector and transformations made with four size classes to minimize size bias. Details of each source of RNA and library construction can be obtained at http://cgpdb.ucdavis.edu/TAG_SEQ-NOT found.
  Tel: 1-(530)-742-1742
Fax: 1-(530)-742-1742
Email: akozik@atgc.org [michelmore@vegmail.ucdavis.edu]
Email: contig QG_CA_Contig6253, see http://cgpdb.ucdavis.edu/
for details.
Plate: QGI12 row: D column: 16.
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      393 ATGCCTAGTGATGCGGTTGAAAGCTCCAACTTCGTCGGTCAAGAAGCATGGTTTATTAGGA 452
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                                                                                                                                                                                                                                             /clone="QGI12D16"
/clone_lib="QG_ABCDI lettuce salinas"
/lab_host="E.coli"
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Matches:
Conservative:
Davis, CA 95616, USA
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Indels:

    757
    /organism="Lactuca sativa"
    /cultivar="Salinas"
    /db_xref="taxon:4236"

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Contact: Alexander Kozik [R.W. Michelmore]
University of California at Davis (UCD)
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Sukaryota: Viridiplantae; Streptophyta; Embryophyta; Tracheophyta;
Spermatophyta; Magnoliophyta; eudicotyledons; core eudicots;
Asteridae; euasterids II; Asterales; Asteraceae; Lactuceee;
                                                                                                                                                                                                                                                                                        -----GTTGTTGGTAGTATTCCAATCATTGGTGATACAGCTCAATCCATCATCACCAAA 140
                                                                                                                                                                                                                                                                                                                                  GluGlnThrGlyPheLeuAlaGluGluAlaProAspAsnValLysThrMetLeuArgSer 105
                                                                                                                                                                                                                                                                                                                                                                                                                 LysGlyTyrPheSerSerLysValSerLeuThrGluLysAspGlyAlaTyrThrValHis 125
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       146 LeuSerAspGlyAsnLeuAlaGluTyrTyrArgAsnAlaLeuGluAsnTrpGlnGlnPro 165
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      185 AlaVal---ThrArgLysGlyTyrProLeuAlaLysLeuGlyAsnThrArgAlaAlaVal 203
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                                                                                                                                                                                                                                                                                                                                                                        141 CAAACTGAC-----ATGGCAAATCAATTGATTGATACCACGACTTCTTCTGTCAGGAG 194
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              ValGlySerAspPheAspGlnAspSerTrpGluAsn---SerLysThrSerValLeuGly 184
                                                                                  LeuSerGluAsnLysAlaAlaGlyPheAlaLeuPheLysAsnLysSerProAspThrGlu 45
                                                                                                                                                                   SerValLysLeuLysProLysPheProValArglleAspThrGlnAspSerGluIleLys 65
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      Gaps:
                                          US-09-857-669-2 (1-609) x BQ850925 (1-735)
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                                                                                                                                                                  BM919327 1072 bp mRNA linear EST 12-MAR-2002 AGENCOURT_6715791 NIH_MGC_120 Homo sapiens cDNA clone IMAGE:5748568
                                                                                                                                                                                                                                                                                                   Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Euteleostomi; Mammalia; Eutherla; Primates; Catarrhini; Hominidae; Homo.
1 (bases 1 to 1072)
NIH-MGC http://mgc.ncl.nih.gov/.
NiH-MGC http://mgc.ncl.nih.gov/.
Unpublished (1999)
Contact: Robert Strausberg, Ph.D.
                                                                                                                                                                                                                                                                                                                                                                                                                  Email: cgapbs-remail.nih.gov
Tissue Procurement: Life Technologies, Inc.
cDNA Library Preparation: Life Technologies, Inc.
cDNA Library Arrayed by: The I.M.A.G.E. Consortium (LLNL)
DNA Sequencing by: Agencourt Bioscience Corporation
Clone distribution: MGC clone distribution information can be
found through the I.M.A.G.E. Consortium/LLNL at:
http://image.llnl.gov
Plate: LLAM12776 row: 1 column: 17
High quality sequence stop: 572.
Location/Qualifiers
... 1072
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                                                                  --------ArgProlleAlaPheGlyAspPheGlulleThrGlyThr 232
                                 ------GCAAACAAAATCATTGAAAAAGGTTCTGATTCTGTC
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  5 ProThrAlaLeuLeuLeuProAlaLeuPhePhePheProHisAlaTyrAlaProAlaAla
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                                                                                       GAAAAAACCCTAGAGAAAACCACATCAGCATTGGAGATATCCCAATTCTAGGATCT
AsnProAspThrAlaThrValAspLeuAsnValValValAspSerGly-
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Indels:
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/db_xref="taxon:9606"
/clone="InAGE:5748568"
/clone_lib="KIH_MGC_120"
/lab_host="DH10B"
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963 bp mRNA linear EST 15-JUL-2002
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                                          ---TTCGCAATGTTTGACCAGTCCCAGATCCAGGAGTTT 155
                                                                                                                                                                      LysGluGlnThrGlyPheLeuAlaGluGluAlaProAspAsnValLysThrMetLeuArg 104
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Mammalia: Butheria; Primates; Catarrhini: Hominidae; Homo.

E 1 (bases 1 to 963)

S NIH-MGC http://mgc.nci.nih.gov/.

National institutes of Health, Mammalian Gene Collection (MGC)

L Unpublished (1999)

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Tissue Procurement. ATCC

CDNA Library Preparation: Rubin Laboratory

CDNA Library Arrayed by: The I.M.A.G.E. Consortium (LLNL)

DNA Sequencing by: Agencourt Bioscience Corporation

Clone distribution: MGC clone distribution information can be found through the I.M.A.G.E. Consortium/LLNL at:

http://image.llnl.gov

Plate: LLCM2407 row: f column: 06

High quality sequence stop: 426.
                                  Vertebrata; Euteleostomi;
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Mismatches:
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Best Local Similarity:
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1 (bases 1 to 1086)

NH-MGC http://mgc.nci.nih.gov/.

National Institutes of Health, Mammallan Gene Collection (MGC)

Unpublished (1999)

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CDNA Library Preparation: Michael J. Brownstein (NHGRI), Shiraki
Toshiyuki and Piero Carninci (RIKEN)

CDNA Library Arrayed by: The I.M.A.G.E. Consortium (LLNL)

DNA Sequencing by: Incyte Genomics, Inc.
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                                                           152 AlaGluTyrTyrArgAsnAlaLeuGluAsnTrpGlnGlnProValGlySerAspPheAsp
                                                                                                                                                                                                                                                                                                                                        232 ThrGlnArgTyrProGluGlnIleValSerGlyLeuAlaArgPheGlnProGlyThrPro
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    310 GluTyrGlyLeuGlyGlyLysIleAlaTyr-----AspTyrTyrAsnLeuPheAsn
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         736 GGGGGGGGGGGCCCAGACCCGGGACACGGGAGGTCGGGGGAGGTGTCGTCTGCGAGG
                                                                                                                                                                                                                                                                                                      ProLeuAlaLysLeuGlyAsnThrArgAlaAlaValAsnProAspThrAlaThrValAsp
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645 CTGCCCTGTCCTCTACCAC---
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Clone distribution: MGC clone distribution information can be found through the I.M.A.G.E. Consortium/LLNL at: http://image.llnl.gov blate: LLANI0726 row: c column: 08 High quality sequence stop: 753.
                                                                                                                                                           pBluescriptR (modified
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393 CTTCCGGAGACAGCTGCTCTATCTTCTATGATGGGGGCTACATCAACGCC----
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39
97
118
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Matches:
Conservative:
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Indels:
                                                                                                                                                           /note="Organ: brain; Vector:
                                                                                                                     /clone_lib="NIH_MGC_95"
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/lab_host="DH108"
                                                                      1. .1086
/organism="Homo sapiens"
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Contact: MGC help desk
Email: cgapbs-remail.nih.gov
Tissue Procurement: ATC
CDNA Library Preparation: CLONTECH Laboratories, Inc.
CDNA Library Preparation: CLONTECH Laboratories, Inc.
CDNA Library Preparation: CLONTECH Laboratories, Inc.
DNA Sequencing by: Institute for Systems Biology
http://www.systemsbiology.org
contact: amadanésystemsbiology.org
Anup Madan, Rachel Dickhoff, Jessica Fahey, Stephanie Ford, Julia
Greene, Mark Ketteman and Anuradha Madan
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Clone distribution: MGC clone distribution information can be foun through the I.M.A.G.E. Consortium/LLNL at: http://image.llnl.gov Series: IRAL Plate: 19 Row: c Column: 21
This clone was selected for full length sequencing because it passed the following selection criteria: matched mRNA gi: 7020048
This clone has the following problem: frame shifted.
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Bukaryota; Metazoa; Chordata; Craniata; Vertebrata; Euteleostomi;

Bukaryota; Metazoa; Chordata; Catarrhini; Hominidae; Homo.

1 (bases 1 to 2466)

Strausberg, R.

Direct Submission.

Direct Submisted (31-ANG-2001) National Institutes of Health, Mammalian

Gene Collection (MGC), Cancer Genomics Office, National Cancer

Institute, 31 Center Drive, Room 11A03, Bethesda, MD 20892-2590,
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/db_xref="taxon:9666"
/clone="IMAGE:4070372"
/clssue_type="Bone marrow, acute myelogenous leukemia"
/clone_lib="NHH_MGC_55"
                                                           uSerSerThrAlaLeuIleArgThrSerAla-----ArgAlaGlyTyrPhePheThrPr 472
                                                                                               oGluAsnLysLysLeuGlyThrPheIleIleArgGlyGlnAlaGlyTyrThrValAlaAr 492
                                                                                                                                                                                                                                       -----ATCATGAAGGGATCCTGTGTTTCACC-----774
                                                                                                                                                                                                                                                                                                                192 gAspAsnAlaAspValProSerGlyLeuMetPheArgSerGlyGly-----AlaSerSe 510
                                                                                                                                                                                                                                                                                                                                                          -GlySerValLeuProGluArgAlaLeuLeuValGlySerLeuGluTyrGlnLeuProPh 545
-GCAGGGACGGTCCTGNTCAACTCCCT 689
                                                                                                                                                                                                                                                                                                                                                                                                                                          rValArgGlyTyrGluLeuAspSerIle------GlyLeuAlaGlyProAsn--
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Homo sapiens, clone IMAGE:4070372, mRNA.
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/lab_host="DH10B" /note="Vector: pDNR-LIB" ORIGIN 751 a 484 c 500 g 731 t	Alignment Scores: 7.38 Length: 2466 Score: 95.50 Matches: 81 Score: 36.44 Conservative: 56 Best Local Similarity: 21.54 Mismatches: 125 Query Match: 11 Gaps: 20	US-09-857-669-2 (1-609) x BC013324 (1-2466)	74 LeulleThrGlnGlnGluGluValLeuAspLysGluGlnThrGly 89 :::::         ::		110 SerSerLysValSerLeuThrGluLysAspGlyAlaTyrThrValHisIle 126 ::: :::         ::: 532 ACAGGTGAAGCAAAATGAATCAATCTAGCTGCCCGGTTCATCATCAC 588	127 ThrProGlyProArgThrLysIleAlaAsnValGlyValAlaIleLeuGlyAspIleLeu 146	147 SerAspGlyAsnLeuAlaGluTyrTyrArgAsnAlaLeuGluAsnTrpGlnGlnProVal 166 ::: :::	167 GlySerAspPheAspGlnAspSerTrpGluAsnSerLysThrSerValLeuGlyAlaVal 186 11 ::	187ThrargLysGlyTyrProLeuAlaLysLeuGlyAsnThrargAlaAlaVal 203 ::::::	204 ASIDPTOASPTHEALBTHEVALASPLEUASIVAL-VALASPSETG1 219 11	219 yargProllealaPheGlyAspPheGluIleThrGlyThrGlnArgTyrProGluGlnII 239   1::1	239 eValSerGlyLeuAlaArgPheGlnProGlyThrProTyrAspLeuAspLeuLeuLeuAs 259 11	259 pPheGlnGlnAlaLeuGluGlnAsnGlyHisTyrSerGlyAlaSerValGlnAlaAspPh 279	279 eAspargLeuGlnGlyAsp	291 lSerValThrGluValLysargHisLysLeuGluThrGlyIleArgLeuAspSerGluTy	991 TGGTGCTCCAGAAGATAACCAAGAAGAGGAGGATGAAGGCTTGGGAGTTGAT	JII TGLYLEUGLYGLYGLYGLYGLYGLYGLAGATYFTAFASOLEUPNEASOLYSGLYTYTTLGGL JJJ 1043	331 ySerValValTrpAspMetAspLysTyrGluThrThrLeuAlaAl 346
BA	Alli Pre Sco Per Bes Que DB:	ns	oy Op	oy D	Oy Op	S a	oy og	oy da	ò a	oy og	95 P	Q P	Qy Db	Q Pp	ò	<u>ප</u>	5 6	ò

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OGI9E21.yg.abl QG_ABCDI lettuce salinas Lactuca sativa cDNA clone QGI9E21, mRNA sequence. BQ875852. BP875852.1 GI:22265073
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Lin, H., van Damme, M., Lavelle, D., Chevaller, P., Zlegle, J., Ellison
P., Kolkman, J., Slabaugh, M.S., Litvingston, K., Zhou, Y., Lai, Z.,
Church, S., Jackson, L. and Bradford, K.
Lettuce and Sunflower ESTs from the Compositae Genome Project
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Lactuca sativa
Lactuca sativa
Eukaryota; Viridiplantae; Streptophyta; Embryophyta; Tracheophyta;
Spermatophyta; Magnoliophyta; eudicotyledons; core eudicots;
Asteridae; euasterids II; Asterales; Asteraceae; Lactuceae;
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                                                                                  1117 GGGACAATTATCAGAGGCAGCTCTGCAGAAGCAGCATCAAAGAAATTAT-----AATCG 1170
                                                                                                                                                                      1171 CTGGTTATGT------CAAGCAAGATCTGAGGATCTGTGTTGTTGCTTC 1215
1057 CTCTCATGCTTTTGCTCGAATGGAAGGAGATATTGACAAGCAAAGAAAACTGATCCTTCA 1116
                                                                                                                                                                                                                                                         1216 TCTAAAAGCCTTATAC------CAAACAGGTGTTGATAACTGTGGTCGAACAGT 1263
                                          ----ProArgAsnTyrArgGlyAsnTy 358
                                                                                                                            358 rTrpThrSerAsnValSerTyrAsnArgSerThrThrGlnAsnLeuGluLysArgAlaPh 378
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Unpublished (2002)
Contact: Alexander Kozik (R.W.Michelmore)
Department of Vegetable Crops, R.W.Michelmore Lab
University of California at Davis (UCD)
Asmundason Hall, UCD, Davis, CA 95616, USA
Tel: 1-(530)-742-1742
Fax: 1-(530)-752-9659
Email: akozik@atgc.org [michelmore@vegmail.ucdavis.edu]
                                                                                                                                                                                                                                                                                                                       398 uPheLeuAlaGluGlyArgLysIleProGlySerAspIleAspLeu 413
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      /cultivar="salinas"
/db_xref="taxon:4236"
/clone="QG19821"
/clone_lib="OG_ABCDI lettuce salinas"
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                                          346 aGly---IleSerGln-------
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Plate: QGI9
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/note="Vector: pBRcDNASfiAB; The library was constructed from 10 different sources of RNA from a single genotype. Separate cDNAs were generated using primers that incorporated unique 5' and 3' tags to distinguish each source of RNA. cDNAs were then pooled, size-fractionated, directionally cloned into a custom medium-copy vector and transformations made with four size classes to minimize size bias. Details of each source of RNA and library construction can be obtained at http://cgpdb.ucdavis.edu/TAG_IIB-0G_ABCDI lettuce salinas
TAG_IIB-0G_ABCDI lettuce salinas
TAG_IISUB-flowers pre-fertilized
TAG_SED-GCTFGACGGG"

115 c 112 g 146 t
                                          Contact: Alexander Kozik [R.W.Michelmore]
Department of Vegetable Crops, R.W.Michelmore Lab
Department of California at Davis (UCD)
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Tel: 1-(530)-742-1742
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Email: akozik@atgc.org [michelmore@vegmail.ucdavis.edu]
Delongs to contig QG_CA_Contig6253, see http://cgpdb.ucdavis.edu/
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and Sunflower ESTs from the Compositae Genome Project
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in,H., wan Damme,M., Lavelle,D., Chevalier,P., Ziegle,J., Ellison
.P., Kolkman,J., Slabaugh,M.S., Livingston,K., Zhou,Y., Lai,Z.,
Church,S., Jackson,L. and Bradford,K.
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TAG_LIB-G_CAFCAGGGF 167 t
                                                                                                                                                                                                                                                                                                                                                        622 bp mRNA linear EST 15-AUG-2002
QGI6K24.yg.abl QG_ABCDI lettuce salinas Lactuca sativa cDNA clone
QGI6KZ4, mRNA sequence.
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Unpublished (2002)
Contact: Alexander Kozik [R.W.Michelmore]
Department of Vegetable Crops, R.W.Michelmore Lab
University of California at Davis (UCD)
Asmundson Hall, UCD, Davis, CA 95616, USA
Tel: 1-(530)-752-9659
Email: akozik@atgc.org [michelmore@vegmail.ucdavis.edu]
                                                        363 ATGGCTAGTGATGCGGTTGAAAGCTCAACTTCGTCGTCAAGAAGCATGGTTTATTAGGA 422
                                                                                                                                      423 GCTATTTTATCAGCGGCAGGACAGGTTGTAGAAGATGTTGGAAACACA------470
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                  166 ValGlySerAspPheAspGlnAspSerTrpGluAsn---SerLysThrSerValLeuGly 184
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/cultivar="Salinas"
/db_xref="taxon:4236"
/clone="GG16K24"
/clone="Lib="OG_ABGDI lettuce salinas"
/lab_host="E.coli"
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 220 ---------ArgProlleAlaPheGlyAspPheGlulleThrGlyThr 232
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   LeuSerGluAsnLysAlaAlaGlyPheAlaLeuPheLysAsnLysSerProAspThrGlu
                                                                                                                                                                                                                   3 GTAAACGAGGCACAAGCAACAGGTACATCCATCATCCAAAAG------GGTACTGAG
                                                                                                                                                                                                                                                           SerValLysLeuLysProLysPheProValArgIleAspThrGlnAspSerGluIleLys
                                                                                                                                                                                                                                                                                                                                                                                                                                                        141 CAAACTGAC-----ATGGCAAATCAATTGATTGATACCACGACTTCTTCTGTCAAGGAG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            106 LysGlyTyrPheSerSerLysValSerLeuThrGluLysAspGlyAlaTyrThrValHis
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   126 IleThrProGlyProArgThrLysIleAlaAsnValGlyValAlaIleLeuGlyAspIle
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              255 ATGGGTTCTGATTCAGCTAGCCAAGCATTAGAAACAACCAAGTCGGTTGTCGGAGGTATC
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                                                                                                                                                                                                                                                                                                ------CAAGCTTTAGACACAAAAATCT-----
                                                                                                                                                                                                                                                                                                                                    66 AspMetValGluGluHisLeuProLeulleThrGlnGlnGlnGluGluValLeuAspLys
  Length:
Matches:
Conservative:
Mismatches:
Indels:
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Job time : 1979 secs
                                        Percent Similarity:
Best Local Similarity:
Query Match:
                                                                                                                                                                              56
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Alignment Scores:

GenCore version 5.1.3 Copyright (c) 1993 - 2002 Compugen Ltd.

OM protein - protein search, using sw model

November 9, 2002, 01:20:19 ; Search time 14 Seconds (without alignments) 627.205 Million cell updates/sec Run on:

US-09-857-669-2 3173 1 MMIKPTALLLPALFFFPHAY.....IAYGHSDKKIRWHISLGTRF 609 Title: Perfect score: Sequence:

BLOSUM62 Gapop 10.0 , Gapext 0.5 Scoring table:

92612 Total number of hits satisfying chosen parameters: 92612 seqs, 14418503 residues Searched:

Minimum DB seq length: 0 Maximum DB seq length: 200000000

Post-processing: Minimum Match 0% Maximum Match 100% Listing first 45 summaries

Database

Published_Applications_AA:*

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14: /cgn2_6/ptodata/1/pubpaa/USO0_NEW_PUB.pep:*

Pred. No. is the number of results predicted by chance to have a score greater than or equal to the score of the result being printed, and is derived by analysis of the total score distribution.

SUMMARIES

Description	Sequence 4, Appli	Sequence 2, Appli	Sequence 5106, Ap	Sequence 19, Appl	ģ	Sequence 37663, A		Sequence 12611, A		Sequence 30, Appl	Sequence 299, App	Sequence 5703, Ap	Sequence 176, App	Sequence 190, App	Sequence 10797, A	Sequence 5639, Ap	12610	~	Sequence 4, Appli
ΩI	US-10-027-806-4	US-09-995-749A-2	US-09-815-242-5106	US-09-886-468-19	US-09-871-212-6	US-09-864-761-37663	US-09-740-274-4	US-09-815-242-12611	US-09-737-149-25	US-09-737-149-30	US-09-912-020-299	US-09-815-242-5703	US-09-841-132-176	US-09-841-132-190	US-09-815-242-10797	US-09-815-242-5639	US-09-815-242-12610	rs-09-897-056-7	US-09-747-521-4
DB	σ	σ	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10
% Query Match Length DB	3472	1781	815	922	976	794	1375	3158	3034	3034	382	2025	982	1006	939	2086	5795	1025	764
% Query Match	4.6	3.8	3.7	3.7	3.5	3.4	3.4	3.4	3.3	3,3	3.3	3.2	3.2	3.2	3.2	3.2	3.2	3.1	3.1
Score	146	122	118.5	116	111	108.5	108.5	108.5	106	106	104.5	102	101	,101	100.5	100	100	99.5	66
Result No.	1	7	e	4	5	9	7	<b>6</b> 0	σ	10	11	12	13	14	15	16	17	18	19

Sequence 4, Appli Sequence 2, Appli Sequence 12996, A Sequence 13477, A Sequence 13177, A Sequence 4, Appli Sequence 4, Appli Sequence 24, Appli Sequence 10728, A Sequence 10728, A Sequence 13113, A Sequence 1313, A Sequence 1313, A Sequence 1313, Appli Sequence 180, Appli	
	US-09-815-242-12751 US-09-897-056-5 US-09-816-468-21 US-09-740-274-6 US-09-815-242-13263 US-09-815-242-1328 US-09-815-242-10492 US-09-815-242-10492
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## ALIGNMENTS

y 335 WDWDKYETTLAAGISOPRNYRGNYWTS	yy 362DARLGAEFLAEG 403 	)y 404 RKIPGSDIDLGNSHATMLTASWKRQLLN-NVLHPENG-HYLDGKIGTTLGTF 453	y 454 LSSTALIRTSARAGYFFTPENKKLGTFIIRGOAGYTVARDNADVPSGLMFRSGGASS 510	511	y 570 K	18-995-749A-2 18-99-95-749A-2 18-99-99-99-99-99-99-99-99-99-99-99-99-99
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                                             1390 T------EKNSGNSAYRTNAAFDSNVIFEAFSNFVYTPTKESERANVRIAQN 1435
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1492 LRNAIQALHKAGLQVMADWVPDQIYNLPGKEVATVTRVDDR----GNVWKDAIINNNLYVV 1548
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                307 LDSEYGLG---GKIAYDYYNLFNKGYIGSVVWD----MDKYETTLAAGISQPRNYRGNY- 358
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  ---STALIRTSARAGYFFTPENKKL-------GTFIIRGQAGYTVARDNADVP 498
250 TPYDLDLLLDFQQALEQNGHYSGASVQADFDR---LQGDRVPVKVSVTEVKRHKLETGIR 306
                                                                                                                                                                                                                                                                                                                                                                                                                                       387 DRAG---IDARLGAEFLAEGRKI-----PGSDIDLGNSHATMLTASWKRQLLN- 431
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                APPLICANT: Haselbeck, Kobert
APPLICANT: Ohlsen, Kari L.
APPLICANT: Zyskind, Judith W.
APPLICANT: Zyskind, Judith W.
APPLICANT: Trawick, John D.
APPLICANT: Trawick, John D.
APPLICANT: Grart Grant J.
APPLICANT: Carr, Grant J.
APPLICANT: Vanamoto, Robert T.
APPLICANT: Xu, H. Howard Howard Genes in TITLE OF INVENTION: Prokaryotes
FILE REFERENT APPLICATION HUMBER: US/09/815,242
CURRENT FILING DATE: 2001-03-21
PRIOR APPLICATION NUMBER: 60/191,078
PRIOR FILING DATE: 2000-03-21
PRIOR FILING DATE: 2000-03-21
PRIOR APPLICATION NUMBER: 60/207,727
PRIOR FILING DATE: 2000-10-23
PRIOR FILING DATE: 2000-10-23
PRIOR FILING DATE: 2000-11-27
PRIOR APPLICATION NUMBER: 60/253,625
PRIOR APPLICATION NUMBER: 60/253,931
PRIOR FILING DATE: 2000-11-27
PRIOR APPLICATION NUMBER: 60/253,931
PRIOR FILING DATE: 2000-12-22
PRIOR FILING DATE: 2000-12-22
PRIOR FILING DATE: 2000-12-22
PRIOR FILING DATE: 2000-11-27
PRIOR FILING DATE: 2000-11-27
PRIOR FILING DATE: 2000-11-27
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PRIOR FILING DATE: 2000-13-22
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PRIOR PRIOR FILING DATE: 2000-13-23
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; ORGANISM: Pseuc
US-09-815-242-5106
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                -----GKIGTTLGTFLS-----STALIRTSARAGYFF-----TPENKKLG 478
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                                                                                                                                                                                                                                                                                                                                                                                         -----ENWQQPVG------SDFDQDSWENSKTSVLGAVTRKGYPL------ 193
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       -----AKLGNTRAAVNPDTATVDLNVVVDSGRPIAFGDFEITGTQRYPEQIVSGLARF 246
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 211 IRFAQNTAKNGSGGALYS-----DGDIDIDQNAYVLFRENEALTTAIGKGGAVCCLPTS 264
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 ISYANSONLGGAIAIDTGGEISLSAEKGTITFQGNRTSLPFLNGIHLLQNAKFLKLQARN 373
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           ------NKGYIGSVVWDMDKYETTLAAGISQPRNYRGNY 358
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       -----LAGPNGSVLP------ERALLVGSLEYQLPFTRTLSGAVFHDM 557
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        247 QPGTPYDLDLLLDFQQALEQNGH--YSGASVQADFDRLQGDRVPVKVSVTEVKRHKLETG 304
                                                                                                                                                                                                                                                                                                                           Gaps
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                                                                                                                                                                                                                                                                           3.7%; Score 116; DB 10; Length 922;
18.5%; Pred. No. 0.1;
Live 83; Mismatches 226; Indels 268;
                                                                                                                                                                                                                                                                                                                                                                 108 YFSSKVSLTEKDGAYTVHITPGPRTKIANVGVAILGDILSDGNLAE----YYRNAL-
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               RKIPGSDIDLGNSHATMLTASWKRQLLN------NVLHPENGHYLD-----
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PRIOR APPLICATION NUMBER: 60/114,059
PRIOR FILING DATE: 1998-12-28
PRIOR APPLICATION NUMBER: 60/114,061
PRIOR FILING DATE: 1998-12-28
NUMBER: OF SEQ ID NOS: 26
SOFTWARE: PATENTIN Ver. 2.0
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Patent No. US20020034519A1
GENERAL INFORMATION:
APPLICANT: Tikoo, Suresh
APPLICANT: Babiuk, Lorne
                                                                                                                                                                                          TYPE: PRT ORGANISM: Chlamydia pneumoniae
                                                                                                                                                                                                                                                                                                   Best Local Similarity 18.5%
Matches 131; Conservative
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US-09-871-212-6
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CURRENT PILLIAG DATE: 1999-12-23
PRIOR PELLIAG DATE: 1998-12-23
PRIOR PELLIAG DATE: 1998-12-23
PRIOR FILING DATE: 1998-12-28
                                                                                                                                                                                                                339 DLNPDTM---LTVGADYQDNDPKGSGWSGSFPLFDSQGNRNDVSRSFNNGAKWSSWEQYT 395
                                                      DOVMRHTPGIT---VSAYDTDRNNYYARGFSINNFQYDGIPSTARNVGYSAGNTLSDMAI 242
                                                                                                                                                                                                                                                                                                                                                                                                    RIVFANLEHNFANGWVGKVQLDHKINGYH-----APLGAIMGDWPAPDNSAKIVAQKYT 449
                                                                                                                                                                                                                                                                                                                                                                                                                                               294 TEVKRHKLE---TG----IRLDSEYGLGGKIAYDYYNLFNKGYIGSVVWDMDKYETTLAA 346
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   GIS------QPRNY------RGNYWISNVSYNRSTTQNLEKRAFSGGIWYVRDR 388
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    389 AGIDAR----LGAEFLAEGRKIP--GSDIDLGNSHAT------MLTASWKRQLLNNVLH 435
                                                                                                         KDGAYTVHITPGPRTKIANVGVAILGDILSDGNLAEYYRNALENWQQPVGS-----DFDQ 172
                                                                                                                                              243 YDRVEVLKGATGLLTGAGSLGATI-----NLIR------KKPTHEFKGHVELGA 285
                                                                                                                                                                                                                                                                           203 -VNPDTATVDLNVVVD-----SGRPIAFGDFEITGTQRYPEQIVSGLARFQPGTPYD 253
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       --- DNVKTMLRSKGYFSSKV--SLTE 117
                                                                                                                                                                                                                                                                                                                                                                                                                                                                          550 RVVDYRVTGLNPTIRESGRFIPYVGAVYDLNDTYSVYASYTDIFMPQDSWYRDSSNKLLE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           254 LDLLLDFQQALEQ------ROHYSGASVQADFDRLQGD------RVPVKVSV
                                                                                                                                                                                        173 DSWEN--SKTSVLGAVTRKGYPLAKLGNTRAA-----SKTSVLGAVTRKGYPLAKLGNTRAA-----
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                        DMVEEHLPLITQQQEEVLDKEQTGFLAEEAP---
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Patent No. US20020037293A1
GENERAL INFORMATION:
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Matches 135; Conservative
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FEATURE:
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SEQ ID NO 37663
LENGTH: 794
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             122 NALQVHTGDGLTVTDDKVSLNTQAPLSTTSAGLSLLLGPSLHLGEEERLTVNT----- 174
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              109 FSSKVSLTEKDGAYTVHITPGPRTKIANVGVAILGDILSDGNLAEYYRNALENWQQPVGS 168
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         DFDQDSWENSKTSVLG---AVTRKGYPLAKLGNTRAAVNPDTATVDLNVVVDSGRPIAFG 225
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APPLICANT: Zhang, Linong
TITLE OF INVENTION: WOLDSHIED BOVINE ADENOVIRUS HAVING
TITLE OF INVENTION: ALLTERED TROPISM
FILE REFERENCE: 293102003000
CURRENT APPLICATION NUMBER: US/09/871,212
CURRENT FILING DATE: 2001-05-31
PRIOR APPLICATION NUMBER: 60/208,678
PRIOR RING DATE: 2000-05-31
NUMBER OF SEQ ID NOS: 9
SOFTWARE: PRESEQ for Windows Version 4.0
SEC ID NO 6.5
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Patent No. US20020048763A1
GENERAL INFORMATION:
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Matches 146; Conservative
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### PLICANT; CHEN, WANNER; CHENGE-DERIVED SINILE EXON NUCLEIC ACID PRODES USERUL POF PLICANTANT; CHEN, WANNER; CHENGER, AGAINER; CHENGER, AGAINER; CHENGER; AGAINER; CHENGER; AGAINER; CHENGER; CHENGER;
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; ORGANISM: streptococcus mutans
US-09-740-274-4
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US-09-815-242-12611
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                                                                                                                                              NYRGNYWTSNVSYNRSTTQNLEKRAFSG--GIWYVRDR-AGIDARLGAEFLAEGRKIPGS 409
                                                                                                                                                                                                                                                                                                                                                                                                                                  193 EDAPSGTRVVQVLATDLDEGPNGEIIYSFGSHNRAGVRQLFALDLVTGMLTIKGRLDFED 252
                                                                                                                      149 GNLAEYYRNALENWQQPVGS------DFDQDSWENSKTSVLGAVTRKGYPLAKLGNT 199
                                                                                                                                                                                                                                                                 LDFQQALEQNGHYSGASVQADFDRLQGDRVP--------VKVSVTEV 296
                                                                                                                                                                                                                                                                                                                                     297 KRHKLETGIRLDSEYGLGGKIAYDYY----NLFNKGYIGSVVWDMDKYETTLAAGISQPR 352
                                                                                                                                                                                                                                                                                                                                                                         389 NDNPPQS------ADSSYDVYIEENNLPGAPILNLSVWDPD------APQ 426
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                DIDLGNSHATMLTASWKRQLLNNVLHPENGHYLDGKIGTTLGTFLSSTALIRTSARAGYF 469
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           200 RAAVNPDTATVDLNVVVDSGRPIAFGDFEITGTQRYPEQIVSGLARFQ--PGTPYDLDLL 257
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APPLICANT: Nichols, Scott E.
TITLE OF INVENTION: Glucan-containing Compositions and Paper
FILE REFERENCE: 0357CHE.
CURRENT APPLICATION NUMBER: US/09/740,274
CURRENT FILING DATE: 2000-12-19
PRIOR PLICATION NUMBER: 09/210,361
PRIOR FILING DATE: 1998-12-11
PRIOR FILING DATE: 1998-11-6
PRIOR FILING DATE: 1998-10-16
PRIOR PLING DATE: 1998-01-16
PRIOR PLING DATE: 1995-06-07
PRIOR PLING DATE: 1995-06-07
PRIOR PLING DATE: 1998-01-20
PRIOR PLING DATE: 1998-01-20
PRIOR FILING DATE: 1998-01-20
PRIOR PLICATION NUMBER: 09/008,172
PRIOR APPLICATION NUMBER: 09/008,172
PRIOR APPLICATION NUMBER: 09/008,172
PRIOR APPLICATION NUMBER: 09/008,172
PRIOR PLING DATE: 1998-01-16
PRIOR FILING DATE: 1998-01-16
PRIOR PLING DATE: 1998-01-16
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                                                  115 LTEKDGAYTVHI-----TPGPRTKI-----ANVGVAILGDILS--
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SOFTWARE: FastSEQ for Windows Version 3.0
SEQ ID NO 4
LENGTH: 1375
TYPE: PRT
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Patent No. US20020031826A1
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STTATLTVSVTEDSPEARAEF 615
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  --VSYNRSTTQNLEKRAF--SGCIWYVRDR-----AGIDARLGAE--FLAEGRKIPGSDI 411
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | : |: : : | | : | | | PSTDGKSVHONAALDSRVWFEGFSNFQAFATKKEEYTNVVIAKNVDKFAEWGVTDFEWAP 897
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                                                                                                                                                                                                                                                                                                                                                                                                                                            PGPRTKIANVGVAILGDILSDG-----NLAEYYRNA-----LENWQQPVGSDFDQDS 174
                                                                                                                                                                                                                        729 RTSGVAVIEGNNPS------LRLKASDRVVVNMGAAHKNQAYRPLLLTTDNGIKA 777
                                                                                                                                                                                                                                                                                                83 -- LDKEQTGFL--AEEAPDNVKTMLRSKGYFSSKVS------LTEKDGAYTVHIT 127
                                                                                                                                                                                                                                                                                                                                                                 778 YHSDQEAAGLVRYTNDRGELIFTAADIKGYANPQVSGYLGVWVPVGAAADQDVRVAASTA 837
                                                                                                                                                30 KAAGFALFKNKSPDTESVKLKPKFPVRIDTQDSEIKDMVEEH-----LPLITQQQEEV-- 82
Score 108.5; DB 10; Length 1375; Pred. No. 0.86; 87; Mismatches 269; Indels 189;
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APPLICANT: Haselbeck, Robert
APPLICANT: Ohlsen, Karl L.
APPLICANT: Zyskind, Judith W.
APPLICANT: Trawick, John D.
APPLICANT: Xu, H. Howard
TITLE OF INVENTION: Identification of Essential Genes in
TITLE OF INVENTION: Identification
TITLE OF INVENTION: Prokaryotes
FILE REFERENCE: ELITRA.011A
CURRENT APPLICATION NUMBER: US/09/815,242
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Patent No. US20020061569A1
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   Ouery Match 3.4%;
Best Local Similarity 19.7%;
Matches 134; Conservative 8
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208 ATVDLNVVVDSGRPIAFGDFEITGTQRYPEQIVSGLARFQPG-TPYDLDLLLDFQQALEQ 266
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        434 LHPENGHYLDGKIGTTLGTFLSSTALIRTSARACYFFTPENKKLGTFIIRGQA----- 486
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        54 -----TRTPRELLDVSREGPAAGRRIGLGAGTLGCARLAGRLLPLQVRLVARGAPTA 105
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             106 PSLVLRARAYGARCGVRLLRRSARGAELRSPAVRS-----VPGLGDALCFPAAGGGAA- 158
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    194 GSAELRLVCALGRAAGAVWVELV ----IQATSGTPSESPSVSPSLLNLSOPRAGVVRR 247
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Length 3034;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      3.3%; Score 106; DB 10;
Similarity 20.3%; Pred. No. 4.9;
29; Conservative 73; Mismatches 207;
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  CURRENT FILING DATE: 2001-06-15
PRIOR APPLICATION NUMBER: 60/170,564
PRIOR PILING DATE: 1999-12-14
PRIOR PLING DATE: 1999-12-27
PRIOR FILING DATE: 1999-12-27
PRIOR FILING DATE: 1999-12-27
PRIOR FILING DATE: 1999-12-27
PRIOR FILING DATE: 1999-12-27
PRIOR PILING DATE: 1999-12-27
PRIOR APPLICATION NUMBER: 60/173,544
PRIOR APPLICATION NUMBER: 60/174,404
PRIOR FILING DATE: 2000-01-04
PRIOR APPLICATION NUMBER: 60/174,962
PRIOR FILING DATE: 2000-01-07
PRIOR FILING DATE: 2000-01-07
PRIOR FILING DATE: 2000-01-07
PRIOR FILING DATE: 2000-08-09
NUMBER OF SEQ ID NOS: 49
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                ; ORGANISM: Mus musculus US-09-737-149-25
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Best Local Simi
Matches 129;
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        183 LGAVTRKGYPLAKLGNTRAAVNPDTATVDLNVV-----VDSGRPIAFGDFEITGTQRYP 236
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    EQIVSGLARFQPGTPYDLDLLLDFQQALEQNGHYSGASVQADFDRLQGDRVPVKVSVTEV 296
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APPLICANT: Spaderna, Kerry E.
APPLICANT: Shimkets, Richard A.
APPLICANT: Muralidharra, Padigaru
APPLICANT: Myralidharra, Padigaru
APPLICANT: Spytek, Kimberly A.
TITLE OF INVENTION: Polypeptides and Nucleic Acids Encoding Same
FILE REFERENCE: 15966-620 CIP
CURRENT APPLICATION NUMBER: US/09/737,149
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Query Match 3.4%; Score 108.5; DB 10; Length 3158; Best Local Similarity 20.2%; Pred, No. 3.2; Matches 91; Conservative 66; Mismatches 159; Indels 135;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                27 SENKAAGFALFKNKSPDTESVKLKPKFPVRIDT-QDSEIKDMVEEHLPLITQQQ---
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CURRENT FILING DATE: 2001-03-21
PRIOR APPLICATION NUMBER: 60/191,078
PRIOR PILING DATE: 2000-03-21
PRIOR PILING DATE: 2000-03-21
PRIOR PILING DATE: 2000-05-23
PRIOR PILING DATE: 2000-05-26
PRIOR FILING DATE: 2000-05-26
PRIOR PILING DATE: 2000-05-26
PRIOR PILING DATE: 2000-10-23
PRIOR PILING DATE: 2000-11-27
PRIOR FILING DATE: 2000-11-27
PRIOR FILING DATE: 2000-11-27
PRIOR FILING DATE: 2000-12-22
PRIOR FILING DATE: 2000-12-22
PRIOR FILING DATE: 2000-12-22
PRIOR FILING DATE: 2001-02-22
PRIOR FILING DATE: 2001-02-22
PRIOR FILING DATE: 2001-02-16
NUMBER OF SEC ID NOS: 14110
SEC ID NO 12611
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           ORGANISM: Staphylococcus aureus
US-09-815-242-12611
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US-09-737-149-25
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VEDENDNY------PQFSEKRYVVQ------VPEDVAVNTAVLKVQATDRDQGQ 505
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                                           LHPENGHYLDGKIGTTLGTFLSSTALIRTSARAGYFFTPENKKLGTFIIRGQA---
                                                                                                                                                                     506 NAAIHYSIVSGNLKGQFYLHSLSGSLDVINPLDFEAI 542
                                                                                                                               ----GYTVARDNADVPSGLMFRSGGASSVRGYELDSI 519
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APPLICANT: Ohlsen, Kari L.
APPLICANT: Trawick, John
APPLICANT: Frosyth, R. Allyn
APPLICANT: Frosyth, Jamie M.
APPLICANT: Froshich, Jamie M.
APPLICANT: Tramanco, Robert T.
APPLICANT: Yamanco, Robert T.
APPLICANT: Xu, H. Howard
TITLE OF INVENTION: ESCHERICHIA COLI
TITLE OF INVENTION: ESCHERICHIA COLI
TITLE REFERENCE: ELITAR.001DV1
CURRENT APPLICATION NUMBER: 05/492,709
PRIOR FILING DATE: 2000-01-27
PRIOR FILING DATE: 1999-01-27
NUMBER OF SEQ ID NOS: 485
SOFTWARE: PSALSEQ for Windows Version 3.0
SERIOTH: 382
419 ARSGVVRTRAVVDREEAAEYQLLVEANDQGRN-PGP-
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US-09-815-242-5703
; Sequence 5703, Application US/09815242
                                                                                                                                                                                                                                                                                    Sequence 299, Application US/09912020 Patent No. US20020045592A1
                                                                                                                                                                                                                                                                                                                           GENERAL INFORMATION:
; APPLICANT: Zyskind, Judith
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US-09-912-020-299
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        154 YYRNALENWQQPVGSDFDQDSWENSKTSVLGAVTR----KGYPLAKI,GNTRAAV--NPDT 207
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                207; Indels 228;
                                                                                                      APPLICANT: Quinn, Kerry E.
APPLICANT: Shimkets, Richard A.
APPLICANT: Shimkets, Padigaru
APPLICANT: Muralidhara, Padigaru
APPLICANT: Spytek, Kimberly A.
TITLE OF INVENTION: Polypeptides and Nucleic Acids Encoding Same
FILE REFERENCE: 15966-620 CIP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   3.3%; Score 106; DB 10; Length 3034; 20.3%; Pred. No. 4.9; tive 73; Mismatches 207; Indels 228.
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CURRENT FILING DATE: 2001-06-15
PRIOR APPLICATION NUMBER: 60/170,564
PRIOR FILING DATE: 1999-12-14
PRIOR FILING DATE: 1999-12-27
PRIOR PELING DATE: 1999-12-29
PRIOR APPLICATION NUMBER: 60/174,404
PRIOR PLING DATE: 2000-01-04
PRIOR PLING DATE: 2000-01-07
PRIOR PLING DATE: 2000-01-07
PRIOR PLING DATE: 2000-01-07
PRIOR PLING DATE: 2000-01-07
PRIOR FILING DATE: 2000-01-07
PRIOR PLING DATE: 2000-08-09
NUMBER OF SED ID NOS: 49
               Sequence 30, Application US/09737149 Patent No. US20020077466A1 GENERAL INFORMATION:
                                                                                   APPLICANT: Spaderna, Steven K
APPLICANT: Quinn, Kerry E.
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Best Local Similarity 20.3%
Matches 129; Conservative
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US-09-737-149-30
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          291 VSVTEVKRHKLETGIR-----LDSEYGLGGKIAYDYYNLFNKGYIGSVVWDMD-KYETTL 344
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    -----AAGIS--QPRNYRGNYWTSNVSYNRSTTQNLEKRAFSGGIWYVRDRAGIDAR 394
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Gaps
AS REQUIRED FOR PROLIFERATION IN
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      87;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Length 382;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Query Match 3.3%; Score 104.5; DB 10; Length Best Local Similarity 22.3%; Pred. No. 0.26; Matches 79; Conservative 46; Mismatches 142; Indels
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us-09-857-669-2.rapb

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COCATION: (1)...(982)
COTHER INFORMATION: Xaa - Any Amino Acid
US-09-841-132-176
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Sequence 190, Application US/09841132
Patent No. US20020061848A1
GENERAL INFORMATION:
APPLICANT: Bhatla, Ajay
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            579 W--FSPLAP--FSFDIAY 592
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          Probst, Peter
                                                                                                                                                                                                                                                                                                                                                                                        ORGANISM: Chlamydia
                                                                                                                                                                                                                                                                                                                                                                                                                        FEATURE:
NAME/KEY: VARIANT
                                                                                                                                                                                                                                                                                SEQ ID NO 176
                                                                                                                                                                                                                                                                                                                    LENGTH: 982
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  DMDKYETTLAAGISQPRNYRGNYWTSNVSYNRSTTQNLEKRAFSGGIWYVRDRAGIDARL 395
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               176 ENSKTSVLGAVTRKGYPLAKLGNTRAAVNPDTATVDLNVV-----VDSGRPIAFGDFEI 229
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               290 KVSVTEVK-----RHKLETGI-----RLDSEY---GLGGKIAYDYYNLFNKGYIGSVVW 335
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             3.2%; Score 102; DB 10; Length 2025; 19.4%; Pred. No. 5.8; tive 49; Mismatches 81; Indels 94
                                                                              APPLICANT: Haselbeck, Nobell
APPLICANT: Obligen, Kari L.
APPLICANT: Obligen, Kari L.
APPLICANT: Zyskind, Judith W.
APPLICANT: Zyskind, Judith W.
APPLICANT: Trawick, John D.
APPLICANT: Trawick, John D.
APPLICANT: Trawick, John D.
APPLICANT: Traminoto, Robert T.
APPLICANT: Amamoro, Robert T.
APPLICANT: Xu, H. Howard
ITILE OF INVENTION: Identification of Essential Genes in TITLE OF INVENTION: Dentification of Essential Genes in TITLE OF INVENTION: Dentification of Essential Genes in TITLE OF INVENTION: DATE: 2001-03-21
PRIOR FILING DATE: 2000-03-21
PRIOR PRIOR PELING DATE: 2000-03-21
PRIOR PELING DATE: 2000-05-26
PRIOR PILING DATE: 2000-05-26
PRIOR PILING DATE: 2000-05-26
PRIOR PILING DATE: 2000-10-23
PRIOR PILING DATE: 2000-10-23
PRIOR PILING DATE: 2000-11-23
PRIOR PILING DATE: 2000-11-23
PRIOR PILING DATE: 2000-11-23
PRIOR PILING DATE: 2000-12-22
PRIOR PILING DATE: 2000-12-22
PRIOR PILING DATE: 2000-12-22
PRIOR PILING DATE: 2000-12-22
PRIOR PILING DATE: 2001-02-16
NUMBER OF SEQ ID NOS: 14110
SEQ ID NO 5703
LEMETH: 2025
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COCATION: (1)...(2025)
COTHER INFORMATION: Xaa - Any Amino Acid
US-09-815-242-5703
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Patent No. US20020061848al
GENERAL INFORMATION:
APPLICANT: Bhatla, Ajay
APPLICANT: Skeiky, Yagir A.W.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    TYPE: PRT
ORGANISM: Staphylococcus aureus
                                                                APPLICANT: Haselbeck, Robert
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nes 54; Conservative
US20020061569A1
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Matches
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510 SLYMEAGSTLDFVTPQPPQQPPAANQLITLSNLHLSLSSLLANNAVTNPPTNPPAQDSHP 569
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            395 GNLK---RTAKENAADVNGVTVSSQAISMGSGGKITTLRA--KAGHQILFNDPIEMANGN 449
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   199 TRAA------VNP-----DTATVDLNVVVDSGR------PIAFGDFEITGT 232
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     450 NOPAGSSKILKINDGEGYTGDIVFANGSSTLYQNVTIEGGRIVLREKAKLSVNSLSQTGG 509
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             233 QRYPE-----QIVSGLARFQPGTPYDLDLLLDFQQALE------QNGH- 269
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      ------YSGASVQADFDRLQGDRVPVKVSVTEVKRHKLETG------IRL 307
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         570 AVIGSTTAGSVTISGPIFFEDLDDTAYDRYDWLGSNOKINVLKLOLGTKPPANAPSDLTL 629
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           308 DSE---YGLGG--KIAYDYYNLFNKGYIGSVVWDMDKYETTLAAGISQPRNYRGNYWTSN 362
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  530 GNEMPKYGYQGSWKLAWDPNTANNGPYTLKATWTKTGYNPGPERVASLVPN---SLWGSI 686
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          687 LDIRSAHSAIQASVDGRSYCRGLWVSGVSNFFYHDRDALGO--GYRYISGGYSL-GANSY 743
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        413 LGNSHATMLTASWKRQLLNNVLHPENGHYLDGKI-----GTTLGTFLSSTALIRTSARAG 467
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TITLE OF INVENTION: COMPOSITIONS AND METHODS FOR TREATMENT AND TITLE OF INVENTION: DIAGNOSIS OF CHLAMYDIAL INFECTION FILE REFERENCE: 210121.469C8
CURRENT APPLICATION UMBER: US/09/841,132
CURRENT FILING DATE: 2001-04-23
NUMBER OF SEQ ID NOS: 599
SOFTWARE: FASTSEQ for Windows Version 3.0/4.0
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412 .DLGNSH----ATMLTASWKRQLLNNVLH------PENGHYLDG-----KIGTTL- 450
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               290 KDLVIPDPTKTLREGAIV-PWNPIS-----SQYYPQMLEQAATSFGIDMDTPFE-EL 339
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 488 SGGEAQRIRLATQIGSN----LSGVLYILDEPSIGLHQRDNDRLIDSLKKMRDLGNTLI 542
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      78 QQEEVLDKEQTGFLAEEAPDNVK-----TMLRSKGYFSSKVSLTEKDG-----AY 122
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     123 TVHITP----VGVAILGDILSDGNL- 151
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             247 SEHYACPYCGFTVGELEPRLFSFNAPFGACPDCDG------LG-----VKLEVD 289
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               430 EVSELAIKNAVOFFEGVSLSEQEITIARPILKEVEDRLTFLKNVGLDYLTLSR--AAGTL 487
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     3.2%; Score 100.5; DB 10; Length 939; ilarity 18.3%; Pred. No. 2.3; Conservative 89; Mismatches 248; Indels 287;
              APPLICANT: TITAMICA, JOHN D.
APPLICANT: TARAMOLO, ROBERT T.
APPLICANT: Yamamoto, Robert T.
APPLICANT: Yamamoto, Robert T.
APPLICANT: Yamamoto, Robert T.
TITLE OF INVENTION: Dentification of Essential Genes in TITLE OF INVENTION: Prokaryotes
FILE REFERENCE: ELITRA.011A
CURRENT APPLICATION NUMBER: US/09/815,242
CURRENT FILING DATE: 2000-03-21
PRIOR APPLICATION NUMBER: 60/191,078
PRIOR FILING DATE: 2000-05-26
PRIOR PLING DATE: 2000-05-26
PRIOR PRIOR APPLICATION NUMBER: 60/207,727
PRIOR FILING DATE: 2000-10-23
PRIOR PLING DATE: 2000-10-23
PRIOR PLING DATE: 2000-10-23
PRIOR PLING DATE: 2000-11-27
PRIOR PLING DATE: 2000-11-27
PRIOR PLING DATE: 2000-12-22
PRIOR PLING DATE: 2000-12-22
PRIOR PLING DATE: 2010-12-16
PRIOR PLING DATE: 2010-10-2-16
PRIOR PLING DATE: 2010-12-16
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     ; ORGANISM: Enterococcus faecalis US-09-815-242-10797
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   308 DSE---YGLGG--KIAYDYYNLFNKGYIGSVVWDMDKYETTLAAGISQPRNYRGNYWTSN 362
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       419 GNLK---RTAKENAADVNGVTVSSQAISMGSGGKITTLRA--KAGHQILFNDPIEMANGN 473
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                                                                                                                                                                                                                                                                                                                                                                                                                                Query Match 3.2%; Score 101; DB 10; Length 1006;
Best Local Similarity 21.5%; Pred. No. 2.3;
Matches 133; Conservative 70; Mismatches 237; Indels 178; Gaps
                    APPLICANT: Probst, Peter TITLE OF INVENTIONS AND METHODS FOR TREATMENT AND TITLE OF INVENTION: COMPOSITIONS AND METHODS FOR TREATMENT TITLE OF INVENTION: DIAGNOSIS OF CHLAMYDIAL INFECTION FILE REFERENCE: 210121.469C8 CURRENT PILLICATION NUMBER: US/09/841,132 CURRENT FILING DATE: 2011-04-23 NUMBER OF SEQ ID NOS: 599 SOFTWARE: FeatSEQ for Windows Version 3.0/4.0 SEQ ID NO 190 LENGTH: 1006
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APPLICANT: Oblsen, Karl L.
APPLICANT: 2yskind, Judith W.
APPLICANT: Wall, Daniel
APPLICANT: Skeiky, Yasir A.W.
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                                                                                                                                                                                                                                                                                                              ; TYPE: PRT
; ORGANISM: Chlamydia
US-09-841-132-190
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1263 KONLGTLNHITNAQRTALEGQINQATTVDGVNTV--KTNANTLDGAMNSLQGSINDKDAT 1320
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   1.108 AINQIATQVTSTKNALDGTHNLTQAKQTATNAIDGAT---NLNKAQKD--ALKAQVTSAQ 1162
                                                                                                                          1163 RVANVTSIQQTA-----KQTQKYRDA 1203
                                                                                                                                                                                                                                                        1204 EOSKKTAYDOAVAAAKAILNKOTGSNSDKAAVDRALQOVTSTKDALNGDAKL-AEAKAAA 1262
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                                                                                                                                                                                                                                                                                                                        RKIPGSDIDLGNSHATMLTASWKRQL----LNNVLHPENGHYLDGKIGTTLGTFLSSTAL 459
                                                                  RHKLETGIRLDSEYGLGGKIAYDYYNLFNKGYIGSVVWDMDKYETTLAAGISQPRNYRGN 357
                                                                                                                                                                                         358 YWTSNVSY-----NRSTTQNLEKRAFSGGIWYV---RDRAGIDARLGAEFLAEG 403
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                                                                                                                                                                                                                                                                                                                                                                                                                                                      IRTSARAGYFFTPENKK------LGTF11RGQAGYTVARDNADVPSGLMFRS----GG
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        APPLICANT: Yamanoto, Robert T.
APPLICANT: Xu, H. Howard
TITLE OF INVENTION: Identification of Essential Genes in
TITLE OF INVENTION: Prockaryotes
FILE REFERENCE: ELITRA.011A
CUNRENT PELING DATE: 2001-03-21
PRIOR APPLICATION NUMBER: 60/191,078
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    508 ASSVRGYELDSIGLAGPNGSVLPE-RALLVGSLEYQLPFTRTLSG 551
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           PRIOR FILING DATE: 2000-03-21
PRIOR APPLICATION NUMBER: 60/206,848
PRIOR APPLICATION NUMBER: 60/207,727
PRIOR PILING DATE: 2000-05-25
PRIOR FILING DATE: 2000-05-26
PRIOR FILING DATE: 2000-05-26
PRIOR FILING DATE: 2000-05-36
PRIOR FILING DATE: 2000-10-33
PRIOR APPLICATION NUMBER: 60/253,625
PRIOR APPLICATION NUMBER: 60/253,625
PRIOR APPLICATION NUMBER: 60/253,625
PRIOR FILING DATE: 2000-11-27
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Staphylococcus aureus
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Zyskind, Judith W.
Wall, Daniel
Trawick, John D.
Carr, Grant J.
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Matches 103; Conserv
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543 VVEHDEDTMMASDYLIDVGPGAGHLGGEIVAAGTPEEVAKNPHSLTGQ--YLSGKKVIPV 600
                                                                                                                                                                                         -----VGSLEYQLPFTRTLSGAVFHDMGDAAANFK 565
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19.6%; Pred. No. 9;
Lve 81; Mismatches 215; Indels 126;
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                                                                  ----GLAGPNGSVLPERALL---
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APPLICANT: Xu, H. Howard
TITLE OF INVEWINON: Identification of Essential Genes in TITLE OF INVEWINON: Howard
TITLE OF INVEWINON: Prokaryotes
FILE REFRERENCE: ELITRA.01A
CURRENT APPLICATION NUMBER: 05/191,078
PRIOR APPLICATION NUMBER: 60/206,848
PRIOR APPLICATION NUMBER: 60/206,848
PRIOR FILING DATE: 2000-03-21
PRIOR FILING DATE: 2000-05-23
PRIOR FILING DATE: 2000-05-26
PRIOR FILING DATE: 2000-11-27
PRIOR APPLICATION NUMBER: 60/25,625
PRIOR FILING DATE: 2000-11-27
PRIOR APPLICATION NUMBER: 60/253,625
PRIOR FILING DATE: 2000-11-27
PRIOR APPLICATION NUMBER: 60/253,625
PRIOR FILING DATE: 2000-11-27
PRIOR FILING DATE: 2000-11-27
PRIOR FILING DATE: 2000-11-27
PRIOR APPLICATION NUMBER: 60/269,308
PRIOR FILING DATE: 2000-10-22
PRIOR FILING DATE: 2000-10-22
PRIOR FILING DATE: 2000-10-22
PRIOR FILING DATE: 2000-10-22
PRIOR FILING DATE: 2000-05-36
PRIOR FILING DATE: 2000-10-22
PRIOR FILING DATE: 2000-05-36
PRIOR FILING DATE: 2000-10-22
PRIOR FILING DATE: 2000-05-36
PRIOR PRIOR DATE: 2000-05-36
PRIOR PRIO
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                                                               PSGLMFRSGGASSVRGYELDSI ----
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; ORGANISM: Staphylococcus aureus
US-09-015-242-5639
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Zyskind, Judith W.
Wall, Daniel
Trawick, John D.
Carr, Grant J.
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Best Local Similarity 19.6%
Matches 103; Conservative
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APPLICANT:
                                                           498
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APPLICANT: Galloway, Darrel
APPLICANT: Galloway, Darrel
APPLICANT: Mateczun, Alfred
CURRENT FILL REFERENCE: 22727/04079
CURRENT FILLNG DATE: 2000-12-21
NUMBER OF SEQ ID NOS: 8
SOFTWARE: Patentin version 3.0
SEQ ID NO 4.
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                                                                                                    223 RDKIET-----PTPRQY--NSERRMVIYDR-LTWSTQFENFLATKWTTAKRFGLE---G 270
                                                                                                                                                          397 AEFLAEGRK------IPGSDIDLGNSHATMLTASWKRQLLNNVLH-------435
                                                                                                                                                                                                                                                                                                                                                                     ----SLEYQLPFTRTLSGAVFHDMGDAAANFKRMKLKHGSGLGVRWFSPLAPFSFD 589
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    488 YTVARDNADVPSGLMFRSGGASSVRGYELDSIGLAG-PN----GSVLPERALLVG----- 537
                                                                                                                                                                                                         271 AESLIPGMKEMFDRSADLGVENIVIGMPHRGRL-----NVLGNVVRKPLRQIFSEFSGG 324
                                                                                                                                                                                                                                                     ----PENGHYL-DGKIGTTLGTFLSSTALIRTSARAGYFFTPENKKLGTFIIRGQA---G 487
                                                                                                                                                                                                                                                                                             325 TRPVDEVGLYTGTGDVKYHLGTSYDRPTRGGKHLHLSLVANPSHLEAVDPVVIGKTRAKQ 384
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      3.1%; Score 99; DB 10; Length 764;
18.6%; Pred. No. 2.3;
trive 92; Mismatches 221; Indels 172; Gaps
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                                                                      MDKYETTLAAGISQPRNYRGNYWTSNVSYNRSTTQNLEKRAFSGGIWYVRDRAGIDARLG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   493 VVVDLVCYRRFGHNEIDEPSFTOPKMYKVIRSHPS 527
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; ORGANISM: Bacillus anthracis
US-09-747-521-4
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Matches 111; Conservative
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APPLICANT: MIMA, TETSUYA
APPLICANT: MIMA, TAKAO
APPLICANT: IGARASHI, DAISUKE
APPLICANT: IGARASHI, DAISUKE
APPLICANT: OHSUMI, CHIEKO
TITLE OF INVENTION: MATHOD FOR PRODUCING TRANSFORMED PLANT HAVING INCREASED GLUTAMIC
TITLE OF INVENTION: CONTENT
FILE REFERENCE: 2104250S0
CURRENT APPLICATION NUMBER: US/09/897,056
CURRENT FILING DATE: 2001-07-03
PRIOR FILING DATE: 2000-07-17
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                                                                                                                                                                 3481 EQSKKTAYDQAVAAAKAILNKQTGSNSDKAAVDRALQQVTSTKDALNGDAKL-AEAKAAA 3539
                                                                                                                                                                                                                                                                     3440 RVANVISIOCIA-----KOTOKYRDA 3480
                                                                                                                                                                                                                                                                                                                                                                                                                                  :: |: | | : |: | | 3540 KQNLGTLNHITNAQRTALEGQINQATTVDGVNTV--KTNANTLDGAMNSLQGSINDKDAT 3597
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           3598 LRNQ---NYLDADESKRNAYTQAVTAAEGILNKQTGGNTSKADVDNALNTVTRAKAALNG 3654
  --KQQVQQAQNVAG----VDTVKSSANTLNGA----- 3331
                                                                        :| | :: :|||
3332 ----MGTLRNSIQDNTATNNGQNYLDATESNKTNYNNAVDS-----ANGVINATSNPNMDAN 3384
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                                              --VDLNVVVDSGRPIAFGDFEITGTQRYPEQ 238
                                                                                                                                  239 IVSGLARFQPGTPYDLDLLLDFQQALE-QNGHYSGASVQADFDRLQGDRVPVKVSVTEVK 297
                                                                                                                                                                                                                         RHKLETGIRLDSEYGLGGKIAYDYYNLFNKGYIGSVVWDMDKYETTLAAGISQPRNYRGN 357
                                                                                                                                                                                                                                                                                                                    358 YWTSNVSY-----NRSTTQNLEKRAFSGGIWYV---RDRAGIDARLGAEFLAEG 403
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 460 IRTSARAGYFFTPENKK-----LGTFIIRGQAGYTVARDNADVPSGLMFRS---GG
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Indels 167;
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Patent No. US20020100074A1
GENERAL INFORMATION:
APPLICANT: JOE, YUJI
                                          LAKLGNTRAAVNPDTAT------
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US-09-897-056-7
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SOFTWARE: PatentIn version 3.1
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Best Local Similarity .....
Matches 113; Conservative
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Sequence 2, Application US/0933226
Patent No. US20020025318A1
GENERAL INFORMATION:
APPLICANT: Sparling, P. Frederick
APPLICANT: Cornelissen, Cynthia N.
TITLE OF INVENTION: Transferrin-Binding Proteins From
TITLE OF INVENTION: Nelsseria Gonorrhea and Neisseria Meningitidis
NUMBER OF SEQUENCES:
CORRESPONDENCE ADDRESS:
ADDRESSEE: Imclone Systems Incorporated
                                                                                                                               ------LSSTALIRTSARAGYFFTPEN
                                                                                                                                                                                                                                                                                                                                     || :| | :| | :| | :| | 3 | | 11|| | 11|| | 11|| | 11|| | 11|| | 11|| | 11|| | 11|| | 11|| | 11|| | 11|| | 11|| | 11|| | 11|| | 11|| | 11|| | 11|| | 11|| | 11|| | 11|| | 11|| | 11|| | 11|| | 11|| | 11|| | 11|| | 11|| | 11|| | 11|| | 11|| | 11|| | 11|| | 11|| | 11|| | 11|| | 11|| | 11|| | 11|| | 11|| | 11|| | 11|| | 11|| | 11|| | 11|| | 11|| | 11|| | 11|| | 11|| | 11|| | 11|| | 11|| | 11|| | 11|| | 11|| | 11|| | 11|| | 11|| | 11|| | 11|| | 11|| | 11|| | 11|| | 11|| | 11|| | 11|| | 11|| | 11|| | 11|| | 11|| | 11|| | 11|| | 11|| | 11|| | 11|| | 11|| | 11|| | 11|| | 11|| | 11|| | 11|| | 11|| | 11|| | 11|| | 11|| | 11|| | 11|| | 11|| | 11|| | 11|| | 11|| | 11|| | 11|| | 11|| | 11|| | 11|| | 11|| | 11|| | 11|| | 11|| | 11|| | 11|| | 11|| | 11|| | 11|| | 11|| | 11|| | 11|| | 11|| | 11|| | 11|| | 11|| | 11|| | 11|| | 11|| | 11|| | 11|| | 11|| | 11|| | 11|| | 11|| | 11|| | 11|| | 11|| | 11|| | 11|| | 11|| | 11|| | 11|| | 11|| | 11|| | 11|| | 11|| | 11|| | 11|| | 11|| | 11|| | 11|| | 11|| | 11|| | 11|| | 11|| | 11|| | 11|| | 11|| | 11|| | 11|| | 11|| | 11|| | 11|| | 11|| | 11|| | 11|| | 11|| | 11|| | 11|| | 11|| | 11|| | 11|| | 11|| | 11|| | 11|| | 11|| | 11|| | 11|| | 11|| | 11|| | 11|| | 11|| | 11|| | 11|| | 11|| | 11|| | 11|| | 11|| | 11|| | 11|| | 11|| | 11|| | 11|| | 11|| | 11|| | 11|| | 11|| | 11|| | 11|| | 11|| | 11|| | 11|| | 11|| | 11|| | 11|| | 11|| | 11|| | 11|| | 11|| | 11|| | 11|| | 11|| | 11|| | 11|| | 11|| | 11|| | 11|| | 11|| | 11|| | 11|| | 11|| | 11|| | 11|| | 11|| | 11|| | 11|| | 11|| | 11|| | 11|| | 11|| | 11|| | 11|| | 11|| | 11|| | 11|| | 11|| | 11|| | 11|| | 11|| | 11|| | 11|| | 11|| | 11|| | 11|| | 11|| | 11|| | 11|| | 11|| | 11|| | 11|| | 11|| | 11|| | 11|| | 11|| | 11|| | 11|| | 11|| | 11|| | 11|| | 11|| | 11|| | 11|| | 11|| | 11|| | 11|| | 11|| | 11|| | 11|| | 11|| | 11|| | 11|| | 11|| | 11|| | 11|| | 11|| | 11|| | 11|| | 11|| | 11|| | 11|| | 11|| | 11|| | 11|| | 11|| | 11|| | 11|| | 11|| | 11|| | 11|| | 11|| | 11|| | 11|| | 11|| | | 11|| | 11|| | 11|| | 11|| | 11|| | 11|| | 11|| | 11|| | 11|| |
                                                                                                                                                                                                                                                                                    475 KKLGTFIIRGQAG---YTVARDNADV-PSGLMFRSGGAS-----SVRGYEL 516
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APPLICATION NUMBER: US/09/332.22
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REGISTRATION NUMBER: 37,066
RECIECOMENICATION INFORMATION:
TELECOMMUNICATION INFORMATION:
TELEPHONE: (212) 645-1405
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           ZIP: 10014
COMPUTER READABLE FORM:
MEDIUM TYPE: Floppy disk
COMPUTER: 1BM PC COMPATIBLE
OPERATING SYSTEM: PC-DOS/MS-DOS
SOFTWARE: Patentin Paint
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FILING DATE: 05-NOV-1992
PRIOR APPLICATION DATE:
APPLICATION NUMBER: US 07/572,187
                                                                                                                           LHPENGHYLDGKIGTTLGTF------
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ATTORNEY/AGENT INFORMATION:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             TELEFAX: (212) 645-2054 INFORMATION FOR SEQ ID NO:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            SEQUENCE CHARACTERISTICS:
LENGTH: 915 amino acids
TYPE: amino acid
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PRIOR APPLICATION DATA:
APPLICATION NUMBER: 0
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Best Local Similarity
Matches 145; Conserv
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STATE: New York
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APPLICANT: Mateczun, Alfred J.
TITLE OF INVENTION: Methods for Protection Against Lethal Infection with Bacillus And FILE REFERENCE: 22727/04114
CURRENT APPLICATION NUMBER: US/10/106,014
CURRENT FILING DATE: 2002-03-25
PRIOR FLLING DATE: 2000-12-21
NUMBER OF SEQ ID NOS: 8
SOFTWARE: Patentin version 3.1
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                                                                                                                           381 GIWYVRDRAGIDARLGAEFLAEGRKIPGSDIDLG-----NSHATMLTASWKRQLLNNV 433
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    137 VGVAILGDILSDGNLAEYYRNALENWQQPVGSDFDQDSWENSKTSVLGAVTRKGYPLAKL 196
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        197 GNTRAAVNPDTATVDLNVVVDSGRPIAFGDFEITGTQRYPEQIVSGLARFQPGTPYDLDL 256
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      -----LFNKGYIGSV-----VWDMD 338
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                                                                              339 KYETT-----LAAGISQPR---NYRGNYWIS-NVSYNRSTTQNLEKRAF---SG
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18.6%; Pred. No. 2.3;
:lve 92; Mismatches 221; Indels 172;
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Sequence 4, Application US/10106014
Patent No. US20020142002A1
GENERAL INFORMATION:
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ORGANISM: Bacillus anthracis
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Best Local Similarity 18.69
Matches 111; Conservative
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US-10-106-014-4
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LENGTH: 764
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CURRENT APPLICATION NUMBER: US/09/815,242
CURRENT FILING DATE: 2001-03-21
PRIOR APPLICATION NUMBER: 60/191,078
PRIOR FILING DATE: 2000-03-21
PRIOR PLILING DATE: 2000-05-23
PRIOR FILING DATE: 2000-05-23
PRIOR APPLICATION NUMBER: 60/207,727
                                                                                                                                                                                                TOPOLOGY: linear
SEQUENCE DESCRIPTION: SEQ ID NO: 6:
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Patent No. US20020061569A1
                                                                                                                                                                TYPE: amino acid
STRANDEDNESS: <Unknown>
   ATTORNEY/AGENT INFORMATION
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Zyskind, Judith W.
Wall, Daniel
Trawick, John D.
Carr, Grant J.
Yamamoto, Robert T.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               APPLICANT: Haselbeck, Robert
                                                                                                                                                                                                                                                               Query Match
Best Local Similarity 20.5%
Matches 80; Conservative
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                  WE-NSKTSVLG---AVTRKGYPLAKLGNTRAAVNPDTATVDLNVVVDSGRPIAFGDFEIT 230
                                                                                                                                                           234 EAAGRGVQSFNRLAPVDDGSKYAYFIV---EEECKNGGH------EKCKAN--PKK 278
                                                                                                                                                                                                                                                                                       DTRDMTVPAFLTKAVFDANQKQAGSLRGNGKYAGNHKYGGLFTSG-ENNAPVGAEYGTGV 397
                                                                                                                                                                                                                                                                                                                             WYVRDRAGIDARLGAEFLAEGRKIPGSDIDLGNSHATMLTASWKROLLNNVLHPENGHYL 442
                                                                                                                                                                                                                                                                                                                                                   443 DGKICTTLGTFLSSTALIRTSARAGYFFTPENKKLGTFIIRG-----QAGYTVARDNAD 496
                                                                                                                                                                                                                                                                                                                                                                                                                       DNHFQQTHCSADGSDKYCRPSADKPFSYYKSDR-----VIYGESHKLLQAAFKKSFDTAK 492
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                                                                                               --LLIRTGRHA--GEIRAH 233
                                                                                                                                                                                             291 VSVTEVKRHKLETGIRLDSEYGLGGKIAYDYYN-LFNKG-----YIGSVV----WDM 337
                                                                                                                                                                                                                             279 DVVGEDKRQTVSTRDYTGPNRFLADPLSYESRSWLFRPGFRFENKRHYIGGILERTQQTF 338
                                                                                                                                                                                                                                                              DKYETTLAAGIS------QPRNYRGN-YWTSNVSYNRSTTQNLEKRA----FSGGI 382
GPRTKIANVGVAI------LGDILSDGNLAEYYRNALEN----WQQPVGSDF--DQDS 174
                                                                                                                            231 GTQRYPEQIVSGLARFQPGTPYDLDLLLDFQQALEQNGHYSGASVQADFDRLQGDRVPVK
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ADDRESSEE: Arnold, White & Durkee
                                                                                            188 WGIOSKTAYSGKNRGLTOSIALAGRIGGAEA-----
                                                                                                                                                                                                                                                                                                                                                                                                                                                                ---SSVRGYELD-
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INVENTION: COLLAGEN BINDING
AND METHODS OF US
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House-Pompeo, Karen
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COUNTRY: U.S.
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169 DFDQDSWENSKTSVLGAVTRKGY----PLAKLGNT--RAAVNPDTATVDLNVVVDSGRPI 222
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                ----SEYGLGGKIAYDYYNLFNKGYIGSVVWDMDKYETTLAAGISQPRNYRGNYWTSNV 363
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       209 VIGTHSNYYSGQSAITD----FEKAFPGSKI-TVDNTKNTI--DVTIPQGY-GSYNSFSI 260
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       SYNRSTTONLEKRAFSGG-IWY------VRDRA------GIDARLGAEFLAEGR-KIPG 408
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      SDID-----LGNSHATMLTASWKR-----QLLNNVLHPENGHYLDGKIGT-- 448
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TITLE OF INVENTION: Identification of Essential Genes in
TITLE OF INVENTION: Prokaryotes
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  3.1%; Score 7. 1.3; 20.5%; Pred. No. 1.3; 4.42; 4.40 53; Mismatches 142; 4.40 53; Mismatches 142; 5.40 53; Mismatches 142; Mis
NAME: Kitchell, Barbara S.
REGISTRATION NUMBER: 33,928
REGISTRATION NUMBER: 33,928
TELECOMMUNICATION INFORMATION:
TELEPHONE: (512) 418-3000
TELEFAX: (512) 444-7577
INFORMATION FOR SEQ ID NO: 6:
SEQUENCE CHARACTERISTICS:
LENGTH: 512 amino acids
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DB 10;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 64; Mismatches 188;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        3.1%; Score 97.5; Di
Best Local Similarity 18.5%; Pred. No. 2.6;
Matches 101; Conservative 64; Mismatches
                    CURRENT APPLICATION NUMBER: US/09/815,242
CURRENT FILING DATE: 2001-03-21
PRIOR APPLICATION NUMBER: 06/191,078
PRIOR FILING DATE: 2000-03-21
PRIOR FILING DATE: 2000-05-23
PRIOR PELING DATE: 2000-05-23
PRIOR PELING DATE: 2000-05-26
PRIOR FILING DATE: 2000-05-26
PRIOR PILING DATE: 2000-05-26
PRIOR PILING DATE: 2000-10-23
PRIOR PILING DATE: 2000-11-27
PRIOR PILING DATE: 2000-11-27
PRIOR APPLICATION NUMBER: 60/255,055
PRIOR FILING DATE: 2000-11-27
PRIOR APPLICATION NUMBER: 60/255,931
PRIOR APPLICATION NUMBER: 60/255,931
PRIOR APPLICATION NUMBER: 60/257,931
PRIOR APPLICATION NUMBER: 60/257,931
PRIOR APPLICATION NUMBER: 60/257,931
PRIOR PILING DATE: 2000-12-22
PRIOR FILING DATE: 2001-02-16
                                                                                                                                                                                                                                                                                                                                              NUMBER OF SEQ ID NOS: 14110
SOFTWARE: FastSEQ for Windows Version 4.0
                                                                                                                                                                                                                                                                                                                                                                                                                                        ; ORGANISM: Streptococcus pneumoniae US-09-815-242-13477
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  193 LAKLGNTRAAVNPDTAT------VDLNVVVDSGRPIAFGDFEITGTQRYPEQ 238
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        403
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                                                                                                                                                                                                                                                                                                                                                                                                                          EEVLDKEOTGFLAEEAPDN-VKTMLKSKGYFSSKVSLTE-KDGAYTV----HITPGPRT 132
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   ---MGTLRNSIQDNTATKNGQNYLDATERNKTNYNNAVDS----ANGVINATSNPNMDAN 454
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              IVSGLARFQPGTPYDLDLLLDFQQALE-QNGHYSGASVQADFDRLQGDRVPVKVSVTEVK 297
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            RHKLETGIRLDSEYGLGGKIAYDYYNLFNKGYIGSVVWDMDKYETTLAAGISQPRNYRGN 357
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                                                                                                                                                                                                                                                                                                                                          Ouery Match 3.1%; Score 98; DB 10; Length 6281;
Best Local Similarity 19.5%; Pred. No. 76;
Matches 103; Conservative 83; Mismatches 210; Indels 132; Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              358 YWTSNVSY-----NRSTTQNLEKRAFSGGIWYV---RDRAGIDARLGAEFLAEG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              RKIPGSDIDLGNSHATMLTASWKRQL----LNNVLHPENGHYLDGKIGTTLGTFLSSTAL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             460 IRTSARAGYFFTPENKK-----LGTFIIRGQAGYTVARDNADVPSGLMFRS----GG
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Batent No. US20020061569A1

GENERAL INFORMATION:
APPLICANT: Haselbeck, Robert
APPLICANT: Oblean, Rari L.
APPLICANT: Trawick, Judith W.
APPLICANT: Trawick, John D.
APPLICANT: Trawick, John D.
APPLICANT: Tramick, John D.
APPLICANT: Tramick, John D.
APPLICANT: Amamoto, Robert T.
APPLICANT: Xu, H. Howard
TITLE OF INVENTION: Identification of Essential Genes in
TITLE OF INVENTION: Prokaryotes
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           508 ASSVRGYELDSI ---- GLAGPNGSVLPERALLVGSLEYQLPFTRTLSG 551
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | ::| : : || || :| :| :| || ADNLRNAKTSATNTIDGL--PNLTQLQK----DNLKHQVEQAQNVAG 765
PRIOR FILING DATE: 2000-05-26
PRIOR APPLICATION NUMBER: 60/242,578
PRIOR FILING DATE: 2000-10-23
PRIOR APPLICATION NUMBER: 60/253,625
PRIOR FILING DATE: 2000-11-27
PRIOR FILING DATE: 2000-11-27
PRIOR PELING DATE: 2000-12-22
PRIOR APPLICATION NUMBER: 60/257,931
PRIOR FILING DATE: 2001-02-16
NUMBER OF SEQ ID NOS: 14110
SOFTWARE: FASSLEGG FOR WINDOWS VERSION 4.0
SEQ ID NO 12996
                                                                                                                                                                                                                                                                                ; ORGANISM: Staphylococcus aureus US-09-815-242-12996
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-- DNVKTMLRSKGYFSSKVSLTEKDGAYTVHI------TPGPRTKIANVGV 139
                                                                                                                                                                                                                                                                      264 LNDRVGTSYLEKQY---EETLQGKRSVKEIHLDKYGNMESVDTIEEGSKGNNIKL-TIDL 319
                                                                                                                                                                                                                                                                                                                                         140 AILGDILSDGNLAEYYRNALENWQQPVGSDFDQDSWE---NSKTSV------ 182
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      374 ELTPDSLGTVTNVFVPGSVVKAATISSGWENGVLSGNQTLTDQSIVFQGSAPINSWYTQA 433
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             ADFDRLQGDRVPVKVSVTEVKRHKLETGIRLDSEYGLGGKIAYDY-----YNLF 325
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            SAMEKLRS--------TFGEYGLGTATGIDL,PDESTGFVPKEYSFA 515
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           NKGYIGSVVWDMDKYETTLAAGISQPRNYRGNYWTSNVSYN--RSTTQNLEKRAFSGGIW 383
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               FGDFEITGTQ-----RYPEQIVSGLARFQPGTPYDLDLLLDFQQALEQNGHYSGASVQ 276
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              384 YVRDRAGIDARLGAEFLAEGRKIPGSDIDLGNSHATMLTASWKRQLLNNVLHPENGHYLD 443
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 557 GNNDKGGLGDLIQQLQPTEMNKVNISDSDM-------SILHQGFYQVAH 598
                                                         Gaps
                                                                                                                                                                                                                                                                                                                                                                             320 AFQDSV---DALLKSYFNSELENG----GAKYSEGVYAVALNPKTGAVLSMSGIKHDLKTG
                                                                                                      58 DTQDSEIKDMVEE--HLPLITQQQEEVLD------KEQTGFLAEGAP-----
                                                                                                                                                                                                                                                                                                                                                                                                                                                         -----LGAVTRKGYP-----LAKLGNTRAAVNPDTATVDLNVVVDSGRPI-----A
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  444 GKIGTTLGTFLSSTALIRTSARAGYFFTPENKKLGTFIIRGQ-----AGYTVARDNADV
                                                   Indels 193;
Length 685;
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US-09-815-242-5330
: Sequence 5330, Application US/09815242
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APPLICANT:
APPLICANT:
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APPLICANT: Wall, Daniel
APPLICANT: Trawick, John D.
APPLICANT: Trawick, John D.
APPLICANT: Trawick, John D.
APPLICANT: Yamanoto, Robert T.
APPLICANT: Yamanoto, Robert T.
APPLICANT: Xu, H. Howard T.
TITLE OF INVENTION: Identification of Essential Genes in TITLE OF INVENTION: Prokaryotes
FILE REFERENCE: EITTRA.011A
CURRENT APPLICATION NUMBER: 05/19,078
PRIOR APPLICATION NUMBER: 60/19,078
PRIOR FILING DATE: 2000-03-21
PRIOR FILING DATE: 2000-05-26
PRIOR FILING DATE: 2000-05-26
PRIOR FILING DATE: 2000-10-23
PRIOR FILING DATE: 2000-11-27
PRIOR APPLICATION NUMBER: 60/253,625
PRIOR FILING DATE: 2000-11-27
PRIOR FILING DATE: 2000-12-22
PRIOR FILING DATE: 2000-12-21
PRIOR FILING DATE: 2000-12-26
PRIOR FILING DATE: 2000-12-26
PRIOR FILING DATE: 2000-12-27
PRIOR FILING DATE: 2000-12-37
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                ; ORGANISM: Staphylococcus aureus US-09-815-242-5330
                                                                                                                         Ohlsen, Kari L.
Zyskind, Judith W.
                                                                                  APPLICANT: Haselbeck, Robert
US20020061569A1
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APPLICANT: Carry Crant J.
APPLICANT: Carry Crant J.
APPLICANT: Yamamoto, Robert T.
APPLICANT: Yamamoto, Robert T.
APPLICANT: Yau, H. Howard
TTTLE OF INVENTION: Identification of Essential Genes in
TITLE OF INVENTION: Brokarryctes
FILE REFRENCE: ELITRA.011A
CURRENT APPLICATION NUMBER: US/09/815,242
CURRENT APPLICATION NUMBER: 00/191,078
PRIOR APPLICATION NUMBER: 60/206,848
PRIOR APPLICATION NUMBER: 60/206,848
PRIOR APPLICATION NUMBER: 60/207,727
PRIOR FILING DATE: 2000-05-26
PRIOR APPLICATION NUMBER: 60/207,727
PRIOR FILING DATE: 2000-11-27
PRIOR APPLICATION NUMBER: 60/25,625
PRIOR FILING DATE: 2000-11-27
PRIOR FILING DATE: 2001-02-16
NUMBER OF SEQ ID NOS: 14110
SEQ ID NO 12189
SEQ ID NO 12189
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Ouery Match 3.1%; Score 97.5; DB 10; Best Local Similarity 20.1%; Pred. No. 5.1; Matches 95; Conservative 59; Mismatches 199;
Sequence 12189, Application US/09815242 Patent No. US20020061569A1
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               ; TYPE: PRT
; ORGANISM: Staphylococcus aureus
US-09-815-242-12189
                                                                                                                    Ohlsen, Kari L.
Zyskind, Judith W.
Wall, Daniel
Trawick, John D.
                                                                                           APPLICANT: Haselbeck, Robert
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Sequence 82, Application US/09765272
Patent No. US20020061545A1
GENERAL INFORMATION:
APPLICANT: Choi et. al.
TITLE OF INVENTION: Streptococcus pneumoniae Antigens and Vaccines NUMBER OF SEQUENCES: 452
                                                                                                                                               : | || || :| :| i| || :| 341 QHAVIGRLTLTRTDARDIIVSGVNFS----HVGFHSAQGVAEYTVNLRAVRGIFDANVAS 396
                           --YNRSTTQNLEKRAFSG----GIWYVRDRA 389
                                                                                                                 390 GIDARLGAEFLAEGRKIPGSDIDLGNSHATMLTASWKRQLLNNVLHPENGHYLDGKIGTT 449
                                                                                                                                                                                                      150 LGTFLSSTALIRTSAR----AGYFFTPENKKLGTFIIRGQAGYTV-----ARDNADVPS 499
                                                                                                                                                                                                                                                                                                                                        397 AAGANANGAQAETNSQGIGAGVTSLKGAMIVMDMADSARTQLDKIRSDMGSVQMELVTTI 456
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Indels 206; Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          21 APAADLSENKAAGFALFKNKSPDTESVKLKP--KFPVRIDTQDSEIKDMVEEHLPLITQQ 78
                                                                   238 L--GVRASYNVMATGGTPVQSGTVRELTINGVEIGTVNDVHKNDADGRLTNAINSVKDRT
                                                                                                                                                                                                                                                                                              500 GLMFRSGGASSVRGYELDSIGLAGPNGSVL-----PERALL-----VGSLEYQLPFT-
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Length 711;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         3.50 inch, 1.4Mb storage
                                                                                                                                                                                                                                                                                                                                                                                                             :| : || : || | 1457 NNISVTQVNVKAAESQIRDVDFAEESANFSKYNILAQSG 495
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Mismatches 240;
                                                                                                                                                                                                                                                                                                                                                                                      --- DMGDAAANFKRMKLKHGSG 574
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Sclences, Inc
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       DB 10;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        ZIP: 20850
COMPUTER READABLE FORM:
MEDIUM TYPE: Diskette, 3.50 inch, 1.
COMPUTER: HP VECTRA 486/33
OPERATING SYSTEM: MSDOS version 6.2
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   SOFTWARE: ASCII Text
CURRENT APPLICATION DATA:
APPLICATION NUMBER: US/09/765,272
FILING DATE: 22-Jan-2001
CLASSIFICATION: «Unknown>
PRIOR APPLICATION NUMBER: 08/961,083
FILING DATE: «Unknown>
ATTORNEY/AGENT INFORMATION:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     NAME: Brookes, A. Anders
REGISTRATION NUMBER: 36,373
REFERENCE/DOCKET NUMBER: PB340P2
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     TOPOLOGY: linear MOLECULE TYPE: protein SEQUENCE DESCRIPTION: SEQ ID NO: 82:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Score 97;
Pred. No.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         CORRESPONDENCE ADDRESS:
ADDRESSEE: Human Genome Scler
STREET: 9410 Key West Avenue
CITY: Rockville
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          TELECOMMUNICATION INFORMATION
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      309-8512
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            LENGTH: 711 amino acids
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Query Match 3.1%; Scc
Best Local Similarity 18.7%; Pre
Matches 125; Conservative 98;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 STRANDEDNESS: single
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    TELEFAX: (301) 309-1
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  SEQUENCE CHARACTERISTICS
                           344 LAAGISQPRNYRGNYWTSNVS-
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            TYPE: amino acid
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 STATE: Maryland
                                                                                                                                                                                                                                                                                                                                                                                      547 RTLSGAVFH-----
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          COUNTRY: USA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    TELEPHONE:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   us-09-765-272-82
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        US-09-765-272-82
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   RESULT 28
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  -- PVKVSV 293
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            141 -----SFSNKEFOIGAYSNTTVKASIGSTSSDKIGHVRMETSSFSGAGMLASAAAQNL 193
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        TE-----VKRHKLETGIRLDSEYGLGGKIAYDYYNLFNKGYIGSVVWDMDKYETT 343
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 ---IGALSEIINRFSNT 237
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  138 GVAILGDILS-DGNLAEYYRNALENWQQPVGSDFDQDSWENSKTSVLGAVTRKGYPLAKL 196
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          GMAIADSLRSQSANLGQAIRNA----NDAIGMVQTADKAMDEQIKILDTIKTKAVQAAQD 102
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        GNT---RAAVNPDTATV--DLNVVVDSGRPIAFGDFEITGTQRYPEQIVSGLARFQPGTP 251
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Gaps
                                                                                                                                                                                                                                              APPLICANT: Bolin, Ingrid
APPLICANT: Mellgard, Bjorn
APPLICANT: Welnerholm, Ann-Mari
TITLE OF INVENTION: A Vaccine Composition Comprising Helicobacter
TITLE OF INVENTION: PylorI Flagellin Polypeptide
NUMBER OF SEQUENCES: 12
CORRESPONDENCE ADDRESS:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             3.1%; Score 97; DB 8; Length 514;
19.8%; Pred. No. 1.8;
ive 71; Mismatches 193; Indels 152;
421 LTASWKRQLLNNVLHPENGHYLDGKIGTTLGTFLSSTALIRTSARACYFFTP 472
                              SOFTWARE: PALENTIN SISTEM.

CURRENT APPLICATION DATA:

APPLICATION NUMBER: US/08/973,028

FILLING DATE: 03-DEC-1997

CLASSIFICATION: 424

PRIOR APPLICATION DATA:

APPLICATION NUMBER: PCT/SE97/01928

FILLING DATE: 18-NOV-1997

PRIOR APPLICATION DATA:

APPLICATION NUMBER: SE 9604322-9

FILLING DATE: 25-NOV-1996

ATTORNEY/AGENT INFORMATION:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                252 YDLDLLLDFQQALEQNGHYSGASVQADFDRLQGDRV-----
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               194 TEVGLNFKQVNGVNDYKIET-VRISTSAGTG----
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     REFERENCE/DOCKET NUMBER: 1103326-0289
TELECOMMUNICATION INFORMATION:
TELEPHONE: (212) 819-8515
TELEFAX: (212) 354-8113
INFORMATION FOR SEQ ID NO: 4:
                                                                                                                                                                                                                                                                                                                                                                                                      E: White & Case LLP
1155 Avenue of the Americas
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 COMPUTER: 1BM PC COMPATIBLE OPERATING SYSTEM: PC-DOS/MS-DOS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              NAME: Cleland, Thelma A. Chen REGISTRATION NUMBER: 40,948
                                                                                                                                                        Sequence 4, Application US/08973028 Patent No. US20020028210A1
                                                                                                                                                                                                                         Berglindh, Thomas
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     COMPUTER READABLE FORM:
MEDIUM TYPE: Floppy disk
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    SEQUENCE CHARACTERISTICS:
LENGTH: 514 amino acids
TYPE: amino acid
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Query Match
Best Local Similarity 19.89
Matches 103; Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         N: United States 10036-2787
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          ; MOLECULE TYPE: protein US-08-973-028-4
                                                                                                                                                                                                      GENERAL INFORMATION:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                         New York
                                                                                                                                                                                                                                                                                                                                                                                                                                                  New York
                                                                                                                                                                                                                                                                                                                                                                                                         ADDRESSEE:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       TOPOLOGY:
                                                                                                                                                                                                                       APPLICANT:
APPLICANT:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            COUNTRY:
                                                                                                                                 US-08-973-028-4
                                                                                                                                                                                                                                                                                                                                                                                                                           STREET:
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214 NGYNQFSYDITKYLQKDGREN--VIAVHAVNKQ--PSSRWYSGSGIYRDVTLQVTDKVHV 269
                                                                                                                                                                                                                                                                          270 EKNGTTILTPKLEEQQHGKVETHVTSKIVNTD---DKDHELVAEY-QIVERGGHAVTGLV 325
                                                                                                                                                                                                                                                                                                                                                               : |: | : | : | 326 RTASRTLKAHESTSLDAILEVERPKLWTVLNDKPALYELITRVYRDGQLVDAKKDLFG-- 383
                                                                                                                                                                                                                                                                                                                                                                                                                                                        384 -YRYXHWTPNEGF--SLNGERIKFH-----GVSLHHDHGALGAEENYKAEYRLKQMKEM 435
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  GTFLSSTALIRTSARAGYFFTPENKKLGTFIIRGQAGYTVARDNADVPSGLMFRSGGASS 510
                                                                                -----SKGYFSSKVSLTEKDGAYTVHITPGPRTKIANVGVAILGDILSDGNLAEYYR 156
                                                                                                                 162 NEGGQLNGGEAWYRKTFKLDEKDLKKNVRLTFD------GVYMDSQVYVNGQLVGHYP 213
                                                                                                                                                                 NALENWOOPVGSDFDQDSWENSKTSVLGAVTRKGYPLAKLGNTRAAVNPDTATVDLNVVV 216
                                                                                                                                                                                                                                                                                                                                                                                                                       318 AYDYYNLF-NKGYIGSVVWDMDKYETTLAAGIS-----QPRNYRGNYW----- 359
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        ---TSNVSYNRSTTQNLE---------KRAFSGGIWYVRDRAGIDARLG 396
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         397 AEFLAEGRKIPGSDIDL-----GNSHATMLTASWKRQLLNNVLHPENGHYLDGKIGTTL 450
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     536 ATVKRLVKVIKDVDKTRY-----SGGHEK 572
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            511 VRGYELDSIGLAGPNGSVLPERA----LLVGSLEYQLPFTRTLSGAVFHDMGDAAANFK 565
                          276 QADFDRLQGDRVPVKVSVTEVKRHKLET--------GIRLDSEYGLGGKI 317
                                                                                                                                                                                                                                                  D-SGRPIAFGDFEITGTQRYPEQIVSGLARFQPGTPYDLDLLLDFQQALEQNGHYSGASV
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Score 97; DB 10; Length 1087;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Sequence 24, Application US/09918909
PRICENT NO. US20020090704A1
GENERAL INFORMATION:
APPLICANT: Allen, Steve
APPLICANT: Calmi, Perry G.
APPLICANT: Orozco Jr., Emil M.
TITLE OF INVENTION: SUCROSE PHOSPHATE SYNTHASE
FILE REFERENCE: BB1166 US CIP
CURRENT APPLICATION NUMBER: US/09/918,909
CURRENT APPLICATION NUMBER: 60/084,529
PRIOR FILING DATE: 1998-05-07
PRIOR PLING DATE: 1999-05-07
PRIOR APPLICATION NUMBER: PCT/US99/09865
PRIOR APPLICATION NUMBER: 09/084,529
PRIOR APPLICATION NUMBER: 09/084,530
-----QEEVLDKEQTGFL----AEEA--PD-NVKTMLR-
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   SOFTWARE: Microsoft Office 97
SEQ ID NO 24
LENGTH: 1087
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    NUMBER OF SEQ ID NOS:
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620 ERELKHSNG 628
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US-09-918-909-24
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                                                                                                                                                                                                                                                                                                                   -AFGDFEITGTQRYPEQIVSGLARF-----QPG-----TPYDLDLLLDFQQALE 265
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                QNGHYSGA---SVQADFDR-LQGDRVPVKVSVTEVKRHK-LETGIRLDSEYG----- 312
                                                                                                             NVKTMLRSKGYFSSKVSLTEKDGAYTVHITPGPRTKI---------134
                                                                                                                                                                                                                                                                                                                                                                                           -----ANVG-----VAILGDILSDGNLAEYYRNALENWQQPVGSDFDQDSWENSKTS 181
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              VLGAVTRKGYPLAKLGNTRAAVNP----- 222
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         495 GNGDGSGSPDPPIWADIMRFFSNPRKPMILALARPDPKKNITTLVKAFGEHRELRNLANL 554
                                                                                                                                                                                  -----EAPD----- 97
                                  Gaps
                                                                                FPHAYAPAADLSENKAAGFALFKNKSPDTESVKLKPKFP-----VRIDTQDSEIKD---- 66
     Pred. No. 5.9;
3; Mismatches 165; Indels 150;
                                                                                                                                                                                                                                                                                                                                                                                                                           SCHEMENTION:

APPLICANT: Haselbock, Rari L.
APPLICANT: Oblsen, Rari L.
APPLICANT: Oblsen, Rari L.
APPLICANT: Wall, Daniel
APPLICANT: Wall, Daniel
APPLICANT: Trawick, John D.
APPLICANT: Trawick, John D.
APPLICANT: Trawick, John D.
APPLICANT: Yammanco, Robert T.
APPLICANT: Yammanco, Robert T.
APPLICANT: Yammanco, Robert T.
APPLICANT: Xu, H. Howard
ITTLE OF INVERTION: Prokaryotes
FILE REPERENCE: ELITRA.011A
CURRENT APPLICATION NUMBER: 60/191,078
FRIOR APPLICATION NUMBER: 60/191,078
FRIOR APPLICATION NUMBER: 60/206,848
FRIOR APPLICATION NUMBER: 60/206,848
FRIOR APPLICATION NUMBER: 60/206,848
FRIOR FILING DATE: 2000-05-23
FRIOR PLICATION NUMBER: 60/205,848
FRIOR FILING DATE: 2000-10-23
FRIOR APPLICATION NUMBER: 60/205,938
FRIOR APPLICATION NUMBER: 60/253,625
FRIOR APPLICATION NUMBER: 60/253,625
FRIOR APPLICATION NUMBER: 60/253,625
FRIOR APPLICATION NUMBER: 60/253,635
FRIOR APPLICATION NUMBER: 60/253,635
FRIOR APPLICATION NUMBER: 60/253,635
FRIOR FILING DATE: 2000-11-27
FRIOR FILING DATE: 2000-11-27
FRIOR FILING DATE: 2000-12-27
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SOFWARE: FastSEQ for Windows Version 4.0
SEQ ID NO 10728
LENGTH: 778
TYPE: PRT
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Patent No. US20020061569A1
     18.9%;
                             88; Conservative
Best Local Similarity
Matches 88; Conserv
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                                                                                                                                                                                                  124 VHITPGPRTKIANVGVAILGDILSDGNLAEYYRNALENWQQPVGSDFDQDSWENSKTSVL 183
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                                                                                                                            83 LDKEQTGFLA******EEAPDNVK******TMLRSKGYFSSKVSLTEKDGAYT 123
                                                                                                                                                              225 LDLPOTALLAGMPOAPNSYDPYTKPDTAKERRDVVLYTM-----YDNKKISKAEYEKAKA 279
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              421 LTASWKRQLLNNVLHPENG-----GTFL 454
                                                                                           Gaps
                                                   3.0%; Score 96.5; DB 10; Length 778; 20.4%; Pred. No. 3.8; Live 67; Mismatches 166; Indels 217;
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APPLICANT: Object.
APPLICANT: Taskind, Judith W.
APPLICANT: Taskind, Judith W.
APPLICANT: Trail, Daniel
APPLICANT: Trail, Daniel
APPLICANT: Trail, Daniel
APPLICANT: Tammoto, Robert T.
APPLICANT: Yammoto, Robert T.
APPLICANT: Xu, H. Howard Hication of Essential Genes in TITLE OF INVENTION: Identification of Essential Genes in TITLE OF INVENTION: Prokaryotes
FILE REFERENCE: ELITRA.011A
CURRENT FILING DATE: 2001-03-21
PRIOR APPLICATION NUMBER: 60/206,848
PRIOR FILING DATE: 2000-03-21
PRIOR FILING DATE: 2000-03-23
PRIOR FILING DATE: 2000-05-26
PRIOR FILING DATE: 2000-05-26
PRIOR FILING DATE: 2000-05-26
PRIOR FILING DATE: 2000-05-26
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; ORGANISM: Enterococcus faecalis US-09-815-242-10728
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                                                                                       Matches 115; Conservative
                                                                        Similarity
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                                                                        Best Local
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           66; Mismatches 173;
                                                                                                                                                                                                                                                                                                                                                                                                                                                    3.0%; Score 96.5; DI 19.2%; Pred. No. 7.7;
PRIOR FILING DATE: 2000-10-23
PRIOR APPLICATION NUMBER: 60/253,625
PRIOR PELING DATE: 2000-11-27
PRIOR PELING DATE: 2000-12-22
PRIOR PELING DATE: 2000-12-22
PRIOR PELING DATE: 2001-02-16
PRIOR FILING DATE: 2001-02-16
NUMBER OF SEQ ID NOS: 14110
SOFTWARE: FASTSEQ for Windows Version 4.0
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Patent No. US20020061569A1
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APPLICANT: 298kInd, Judith W.
APPLICANT: Wall, Daniel
APPLICANT: Trawick, John D.
APPLICANT: Carr, Grant J.
APPLICANT: Yamamoto, Robert T.
APPLICANT: Yumamoto, Robert T.
                                                                                                                                                                                                                                                                                                                                                           ; ORGANISM: Staphylococcus aureus US-09-815-242-5908
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Matches 85; Conserva
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SEQ ID NO 5908
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us-09-857-669-2.rapb

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RESULT 34
US-10-007-693-75
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                                                                                                                                                                                                                                                                                                                                                                                                             Length 1269;
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APPLICANT: Schafer, Thomas
APPLICANT: Schafer, Thomas
APPLICANT: Ostergaard, Peter Rabbek
APPLICANT: Ostergaard, Peter Rabbek
APPLICANT: Hock, Lisbeth Hedegaard
TITLE OF INVENTION: A 2.6,-b-D-Fructan Hydrolase Enzyme And
TITLE OF INVENTION: Process For Using The Enzyme
FILE REPERENCE: 5540.200-US
CURRENT APPLICATION NUMBER: US/09/969,362
CURRENT FILING DATE: 1099-09-17
                                                                                                                                                                                                                                                                                                                                                                                                       Query Match 3.0%; Score 96.5; DB 10;
Best Local Similarity 19.2%; Pred. No. 8.3;
Matches 85; Conservative 66; Mismatches 173;
        PRIOR APPLICATION NUMBER: 6/207,727
PRIOR FILING DATE: 2000-05-26
PRIOR FILING DATE: 2000-05-26
PRIOR FILING DATE: 2000-10-23
PRIOR FILING DATE: 2000-11-27
PRIOR APPLICATION NUMBER: 60/253,625
PRIOR PILING DATE: 2000-11-27
PRIOR FILING DATE: 2000-12-22
PRIOR FILING DATE: 2000-12-22
PRIOR FILING DATE: 2000-12-22
PRIOR FILING DATE: 2001-02-16
NUMBER OF SEQ ID NOS: 14110
SOFTWARE: PRESIDENCE: 14110
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Patent No. US2002000076790A1
GENERAL INFORMATION:
APPLICANT: MOLIEr, Soren
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L----NHLDOLTPAQQQALENQI 913
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2000-05-23
FILING DATE:
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                SLVFRSND---TGWSSYMLQVVPQAGVIRLRDASGQPGT-----LNVEHKANLESGGIYH 172
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             DLGNSHATMLTASWKRQLLNNVLHPENGHYLDGKIGTTLGTFLSSTALIRTSARAGYF-- 469
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                --GARHHIEVIAS-----GSLIQVYVDGYTPAAVEVTDKSYAKGNAGLVVQQGMAYFQD 382
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         -FTPENKKLGTFIIRGQAGYTVARDNADVPSGLMFRSG------GASSVRGYELDSIG 520
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          188 R-----DKTYDLNVVV----DS 218
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      219 GRPIAFGDFEITGTQRYPEQIV--SGLARF----QPGTPYDLDLLLDFQQALEQNGHY- 270
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      271 ----SGASVQADFDRIQGDRVPVKVSVTEVKRHKLETGIRLDSEYGLG--GKIAYDYYN 323
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        324 LFN-----KGYIGSVVWDMDKYETTL----AAGISQPRN-------YRGNYWT 360
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 SNVSYNRSTTQNLEKRAFSGG----IWYVRDRAGIDARL----GAEFLAEGRKIPGSDI 411
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Gaps
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Indels 181;
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Patent No. US20020146776A1

GENERAL INFORMATION:
APPLICANT: Bhatia, Ajay

TITLE OF INVENTION: COMPOUNDS AND METHODS FOR TREATMENT:
TITLE OF INVENTION: COMPOUNDS OF CHLAMYDIAL INFECTION
FILE REFERENCE: 210121.515C2
CURRENT APPLICATION NUMBER: US/10/007,693

CURRENT FILING DATE: 2001-12-05

NUMBER OF SEQ ID NOS: 157

SEQ ID NO 75
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              3.0%; Score 96.5; DB 10;
19.4%; Pred. No. 8.3;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              72; Mismatches 221;
PRIOR APPLICATION NUMBER: PA 1998 01623
PRIOR FILING DATE: 1998-12-08
PRIOR APPLICATION NUMBER: 60/101,615
PRIOR FILING DATE: 1998-09-24
PRIOR FILING DATE: 1998-12-10
PRIOR FILING DATE: 1998-12-10
NUMBER OF SEQ ID NOS: 15
SOFTWARE: FastSEQ for Windows Version 3.0
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     ; TYPE: PRT
; ORGANISM: Paenibacillus pabuli
US-09-969-362-3
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Matches 114; Conservative
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; TYPE: PRT
; ORGANISM: Chlamydia
US-09-841-132-180
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US-09-815-242-5834
SEQ ID NO 180
LENGTH: 1752
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APPLICANT:
APPLICANT:
                                                                                Query Match
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                                                                                                                                                                        HITPGPRTKIANVGVAILGDILSDGNLAEYYRNALENW-----QQPVGSDFD----- 171
                                                                                                                                                                                                                                                                                                                                    294
                                                                                                                                                                                                                                                                                                                                                  294 GDVTLTDCATGLDLEALRLVKDFSRGGAVFTARNHEVQNNLAGGILSVVGNKGAIVVEKN 353
                                                                                                                                                                                                                                                                                                                                                                                                                                             KYETTLAAGISQPRNYRGNYWTSNVSYNRSTTQNLEKRAFSGGIWYVRDRAGIDAR---L 395
                                                                                                                                                                                                                                                                                                                                                                                                                                                             446 IGTTLGTFLSSTALIR-TSARAGYFFTPENKKLGTFIIRGQAGYTVARDNADVPSGLMFR 504
                                                                                                                   EEHLPLITQQQEEVLDKEQTGFLAEEAPDNVKTMLRSKGYFSSKVSLTEKDG---AYT-V 124
                                                                                           Gaps
                                                                                                                                               84
                                                                                                                                   GAEF-----LAEGRKIPGSDIDLGNSHATMLTASWKR----QLLNNVLHPENGHYLDGK
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                                                                                                                                                                                                                            -- ODSWENSKTSVLGAVTRKGY -----PLAKLG ----NTRAAVNPDTATVDLNVVVDS
                                                                                                                                                                                                                                             GRPIAFGDFEITG--TQRYPEQIVSGLARFQPGTPYDLDLLLDFQQALEQNGHY-----
                                                                                                                                                                                                                                                                                                                                   ------GGDRVPVKVSVT--
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Sequence 180, Application US/09841132
Sequence 180, Application US/09841132
Sequence 180, US20020061848A1
Septent No. US20020061848A1
Septent No. US20020061848A1
Septent No. US20020061848A1
Septent Setion Setion
Sequence 180, Applicant Setion
Sequence 180, Applicant Setion
TITLE OF INVENTION: COMPOSITIONS AND METHODS FOR TREATMENT AND TITLE OF INVENTION: DAGNOSIS OF CHLAMYDIAL INFECTION
FILE REFERENCE: 210121.469C8
CURRENT FILING DATE: 2001-04-23
SURRENT FILING DATE: 2001-04-23
SOFTWARE: FastSEQ for Windows Version 3.0/4.0
                                                                                          219;
                                                              Length 1609;
                                                                                          Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       SGGASSVRGYELDS --- IGLAGPNGSV -- LPERA -------
                                                              3.0%; Score 96.5; DB 12;
19.8%; Pred. No. 12;
tive 95; Mismatches 230;
           ; TYPE: PRT
; ORGANISM: Chlamydia pneumoniae
US-10-007-693-75
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               583 -- LAPFSFDIAYGHSDKK 598
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                638 QETAPVESDASSTNKDEK 655
                                                              3.0%
Best Local Similarity 19.8%
Matches 134; Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             US-09-841-132-180
LENGTH: 1609
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     1399 LDSNPQTGKLQARWTFDTYRRWVY1PRDNHFY---ANSILGSQ-----NSMIVVKQ 1446
                                                                                                                                                1128 - FSNNSLON------VKL 1154
                                                                                                                                                                                                                                                                                                                                                                                                                                                   NGHY-----SGASVQAD-----FDRLQGDRVPVKVSVTEVKRHKLETGIRLDSE 310
                                                                                                                                                                                                                           EYYRNALENWQQPVGSDFDQDSWENSKTSVLGAVTRKGYPLAKLGNTRAAVNPDTATVDL 212
                                                                                                                                                                                                                                                                                                                                      NVVVDSGRPIAFGDFEIT-----GTQRYPEQIVSGLARFQPGTPYDLDLLLDFQQALEQ 266
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              311 YGLGGKIAYDYYNLFNKGYIGSVVWDMDKYETTLAAGISQPRNYRGNYWTSNVSYNRSTT 370
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 I--RGQAGYTVARDNAD-----VPSGLMFRSGGASSVRGYELDSIGLAGPNGSVLPER 532
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            533 ALLVGSLEYQLPFTRTLSGAVFHDMGDAAANFKRMKLKHGSGLGVRWFSPLAPFSFDIAY 592
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       N---NVLHPENGHYLDGKIGTTLGTFL-----SSTALIRTSARAGYFFTPENKKLGTFI 481
                                                         Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               147 GLI-----NNMLNNARFDDI--AYNNF-----WVSGVGTFLAOOGTPLSEEFSY
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            QNLEKRAFSGGIWYVRDRAGIDARLGAEFLAEGRKIPGSDIDLGNSHATMLTASWKRQLL
                                                         Indels 185;
Length 1752;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           APPLICANT: Tranick, John D.
APPLICANT: Tranick, John D.
APPLICANT: Carr, Grant J.
APPLICANT: Yanamoto, Robert T.
APPLICANT: Yanamoto, Robert T.
TTLE OF INVENTION: Identification of Essential Genes in TTLE OF INVENTION: Prokaryotes
FILE REFERENCE: ELITRA.011A
CURRENT APPLICATION NUMBER: US/09/815,242
CURRENT FILING DATE: 2001-03-21
PRIOR FILING DATE: 2000-03-21
PRIOR FILING DATE: 2000-03-21
PRIOR FILING DATE: 2000-03-21
PRIOR FILING DATE: 2000-03-21
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                                                         68; Mismatches 197;
  DB 10;
                                                                                                                108 YFSSKVSLTEKDGAYTVHITPGPRTKIANVGVAILGD-
  3.0%; Score 96.5; 20.1%; Pred. No. 14
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Sequence 5834, Application US/09815242 Patent. No. US20020061569A1 GENERAL INFORMATION: APPLICANT: Haselbeck, Robert
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               593 ---GHS---DKKIRWHISLGTRF 609
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Ohlsen, Kari L.
Zyskind, Judith W.
Wall, Daniel
Trawick, John D.
                                                         Matches 113; Conservative
                               Best Local Similarity
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400 NQFVDSFIPDTSKLKD--VIDQFDVIYSNDNKTATVDLM--KGQTSSNKQYIIQQV--AY 453
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    348 NYINNEDLSRNMTAYVNQPKNTY-----TKQTFVTNLTGYKFNPNAKNFKIYEVTDQ 399
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  SRQLKDNTQTATADQPKVTMSDSATVKETSSNWQ---SPQNATANQSTTKTSNVTTNDKS 135
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         -----KP------RTLNRMAVNTVAAPQQGTNVNDKVHFSNIDIAID----- 199
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           200 --KGHVNQTTGKTEFWATSSDVLKLKANYT------IDDSVKEGDTFTFKYGQY 245
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     FNKGYI-------GSV----VWDMDKYET--TLAAGISQPRNYRGNYWTSNVSY 365
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           366 NRSTTQNLEKRAFSGGIWYVRDRAGIDARLGAEFLAEGRKIPGSDIDLGNSHATMLTAS- 424
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  304 AKRKNATTDKTAYK------MEVTLGNDTYSE-----EIIVDYGNKKAQPLISST 347
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               -----FTPENKKLGTFIIRGQAGYTVARDNADVPSGLMFRSGGASSVRGYELDSIGLAG 523
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            152 AEYYRNALENWQQPVGSDFDQDSWENSKTSVLGAVTRKGYPLAKLGNTRAAVNPDTATVD 211
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      STTYSN-----KDVSTTPKTTTI- 163
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              212 LNVVVDSGRPIAFGDFEITGTQRYPEQIVSGLARFQPGTPY-----DLDLLLDFQQAL 264
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      265 EQNGHYSGASVQADFDRLQGDRVPVKVSVTEVKRHKLETGIRLDSEYGLGGKIAYDYYNL 324
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          92 AEEAPDNVKTMLRSKGYFSSKVSLTEKDGAYTVHITPGPRTKIANVGVAILGDILSDGNL 151
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 524 PNGSVLPERALLVGSLEYQLPFTRT---LSGAVFHDMGDAAANFKRMKLKHG 572
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Length 841;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | : | : | : | : | : | BDNSSTDN-----GKIDYTLDTDKTKYSWSNSYSNVNGSSTANGDQKKYNLG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    3.0%; Score 95.5; DB 10;
17.3%; Pred. No. 5.3;
Live 77; Mismatches 202;
PRIOR APPLICATION NUMBER: 60/191,078
PRIOR FILING DATE: 2000-03-21
PRIOR PILING DATE: 2000-05-23
PRIOR PILING DATE: 2000-05-23
PRIOR PILING DATE: 2000-05-26
PRIOR APPLICATION NUMBER: 60/207,727
PRIOR PILING DATE: 2000-05-26
PRIOR PILING DATE: 2000-11-23
PRIOR APPLICATION NUMBER: 60/253,625
PRIOR PILING DATE: 2000-11-27
PRIOR PILING DATE: 2000-11-27
PRIOR PILING DATE: 2000-11-27
PRIOR PILING DATE: 2000-12-22
PRIOR PILING DATE: 2001-02-32
PRIOR FILING DATE: 2001-02-16
PRIOR FILING DATE: 2001-02-16
PRIOR PILING DATE: 2001-02-16
NUMBER OF SEO ID NOS: 14110
SEO ID NO 5779
SEO ID NO 5779
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Patent No. US20020661569A1
GENERAL INFORMATION:
APPLICANT: Haselbeck, Robert
APPLICANT: Ohlsen, Kari L.
APPLICANT: 2yskind, Judith W.
APPLICANT: 2yskind, Judith W.
APPLICANT: Trawick, John D.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  ; TYPE: PRT
; ORGANISM: Staphylococcus aureus
US-09-815-242-5779
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Best Local Similarity 17.3%
Matches 92; Conservative
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US-09-815-242-12751
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         501 AA------NNIINEQTATLDNNAINQAATTVNTTKAALHGDVKLQNDKDHAK 546
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                585 -----ALDQLMDALQQSIADKDATRASSAYVNAEPNKKQSYDEAVQNAESIIAGLNN 636
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        351 PRNYRCNYWTSNVSYNRSTTQNLEKRAFSGGIWYVRDRAGIDARLGAEFLAEGRKIPGSD 410
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                80 ---EEVLDKEQTGFLAEEAPDNVKTMLRSKGYFSSKVSLTEKDGAYTVHITPGPRTKI-- 134
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            135 ---ANVGVAILGDILSDGNLAEYYRNAL----ENWQQPVGSDF---DQDSWENSKTSVL 183
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   441 QVTAATLVTAVHQIEQNANTLNQAMHGLRQSIQDNAATKANSKYINEDQPEQQNYDQAVQ 500
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              184 GAVTRKGYPLAKLGNTRAAVNPDTATVDLNVV-----VDSGRPIAFGDFEITGTQRYPE 237
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   238 QIVSGLARFQPGTPYDLDLLLDFQQALEQNGHYSGASVQADFDRLQGDRVPVKVSVTEVK 297
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        547 QTVSQLAHLNNAQKHMEDTLIDSETT---------RTAVKQDLTEAQ 584
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    27 SENKAAGFALFKNKSPDTESVKLKPKFPVRIDT-QDSEIKDMVEEHLPLITQQQ----- 79
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Indels 119;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Length 2437;
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APPLICANT: Haselbeck, Robert
APPLICANT: Oblsen, Kari L.
APPLICANT: 29skind, Judith W.
APPLICANT: Trawick, John D.
APPLICANT: Yamamoto, Robert T.
APPLICANT: Yunamoto, Robert T.
CHERENT: APPLICANT: Yunamoto, Robert T.
CURRENT APPLICANT: Prokaryotes
CURRENT APPLICANT: 2001-03-21
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Query Match 3.0%; Score 96.5; DB 10; Best Local Similarity 19.2%; Pred. No. 23; Matches 85; Conservative 66; Mismatches 173;
PRIOR APPLICATION NUMBER: 60/207,727
PRIOR FILING DATE: 2000-05-26
PRIOR FILING DATE: 2000-05-26
PRIOR FILING DATE: 2000-10-23
PRIOR FILING DATE: 2000-110-23
PRIOR APPLICATION NUMBER: 60/253,625
PRIOR APLICATION NUMBER: 60/257,931
PRIOR APPLICATION NUMBER: 60/257,931
PRIOR APPLICATION NUMBER: 60/269,308
PRIOR FILING DATE: 2001-02-16
NUMBER OF SEQ ID NOS: 14110
SOFWARE: FastSEQ for Windows Version 4.0
SEQ ID NO 5834
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                                                                                                                                                                                                                                                                                                                                                                                                                          TYPE: PRT CRGANISM: Staphylococcus aureus US-09-815-242-5834
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US-09-815-242-5779
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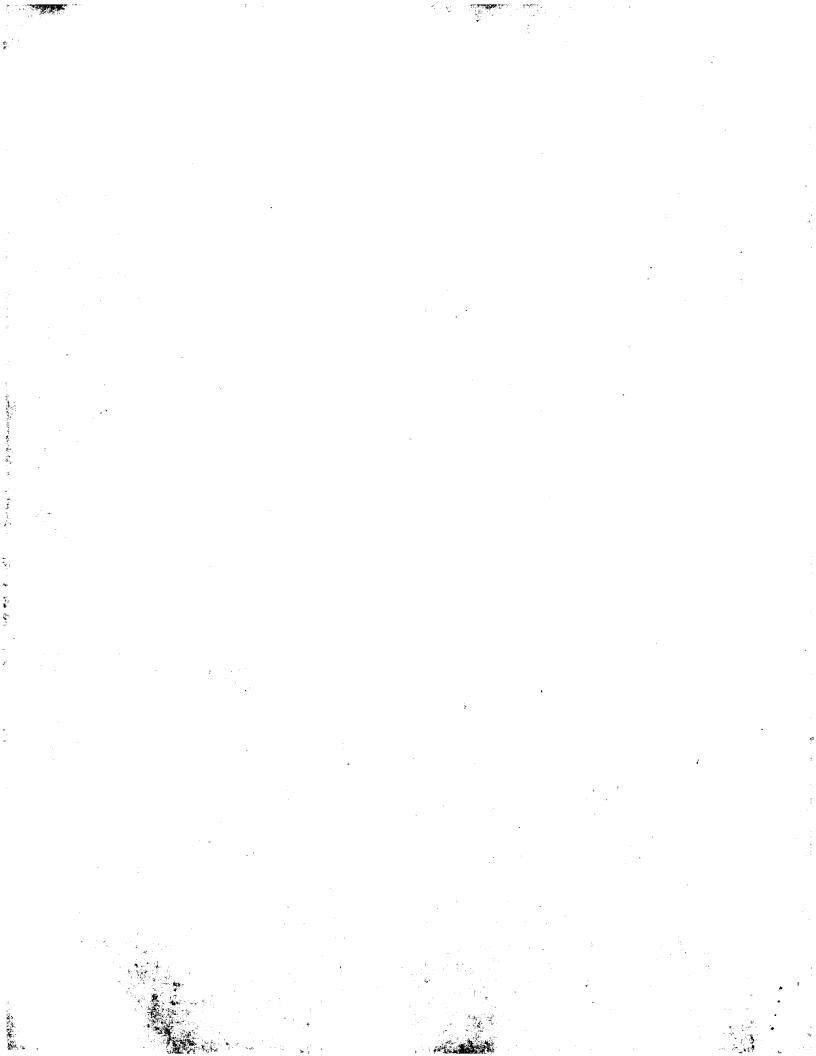
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496 YRRFGHNE 503
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                                                                                           APPLICANT: JOE, APPLICANT: MIWA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         LENGTH: 1017
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Query Match
Best Local Simi
Matches 104;
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US-09-886-468-21
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    200 --KGHVNQTTGKTEFWATSSDVLKLKANYT-----IDDSVKEGDTFTFKYGQY 245
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     348 NYINNEDLSRNMTAYVNOPKNTY-----TKQTFVTNLTGYKFNPNAKNFKIYEVTDQ 399
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           470 -----FTPENKKLGTFIIRGQAGYTVARDNADVPSGLMFRSGGASSVRGYELDSIGLAG 523
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          79 SROLKDNTQTATADQPKVTMSDSATVKETSSNMQ---SPQNATANQSTTKTSNVTTNDKS 135
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            ---GSV-----VWDMDKYET--TLAAGISQPRNYRGNYWTSNVSY 365
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             246 FRPGSVRLPSOTONLYNAOGNIIAKGIYDSTTNTTTTTTTTTTVDQYTNVRGSF--EQVAF 303
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 304 AKRKNATTDKTAYK------MEVTLGNDTYSE-----EIIVDYGNKKAQPLISST 347
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         NOFVDSFTPDTSKLKD--VTDQFDVIYSNDNKTATVDLM--KGQTSSNKQYIIQQV--AY 453
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             152 AEYYRNALENWOOPVGSDFDQDSWENSKTSVLGAVTRKGYPLAKLGNTRAAVNPDTATVD 211
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               212 LNVVVDSGRPIAFGDFEITGTQRYPEQIVSGLARFQPGTPY-----DLDLLLDFQQAL 264
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     265 EQNGHYSGASVQADFDRLQGDRVPVKVSVTEVKRHKLETGIRLDSEYGLGGKIAYDYYNL 324
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                366 NRSTTQNLEKRAFSGGIWYVRDRAGIDARLGAEFLAEGRKIPGSDIDLGNSHATMLTAS- 424
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         92 AEEAPDNVKTMLRSKGYFSSKVSLTEKDGAYTVHITPGPRTKIANVGVAILGDILSDGNL 151
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    -----WKRQLLNNVLHPENGHYLDGKIGTTLGTFLSSTALIRTSARAGYF-----
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Indels 161;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |-----GKIDYTLDTDKTKYSWSNSYSNVNGSSTANGDQKKYNLG 500
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Length 841;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            524 PNGSVLPERALLVGSLEYQLPFTRT---LSGAVFHDMGDAAANFKRMKLKHG 572
APPLICANT: Carr, Grant J.
APPLICANT: Yamamoto, Robert T.
APPLICANT: Yamamoto, Robert T.
TILE OF INVENTION: Identification of Essential Genes in TILE OF INVENTION: DENTIFICATION of Essential Genes in TILE OF INVENTION: PROMARYOUS
FILE REFERENCE: ELITRA.011A
CURRENT APPLICATION NUMBER: US/09/815,242
CURRENT APPLICATION NUMBER: 06/191,078
PRIOR APPLICATION NUMBER: 60/191,078
PRIOR APPLICATION NUMBER: 60/207,727
PRIOR APPLICATION NUMBER: 60/207,727
PRIOR FILING DATE: 2000-05-26
PRIOR PAPLICATION NUMBER: 60/242,578
PRIOR PAPLICATION NUMBER: 60/253,625
PRIOR FILING DATE: 2000-11-27
PRIOR FILING DATE: 2000-11-27
PRIOR FILING DATE: 2000-11-27
PRIOR FILING DATE: 2000-11-27
PRIOR FILING DATE: 2000-12-22
PRIOR FILING DATE: 2001-12-22
PRIOR FILING DATE: 2001-12-22
PRIOR FILING DATE: 2001-12-15
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Ouery Match 3.0%; Score 95.5; DB 10; Best Local Similarity 17.3%; Pred. No. 5.3; Matches 92; Conservative 77; Mismatches 202;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              ; TYPE: PRT
; ORGANISM: Staphylococcus aureus
US-09-815-242-12751
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         RESULT 39
US-09-897-056-5
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APPLICANT: MIWA, TETSUYA
APPLICANT: KIDA, TAKAO
APPLICANT: IGARASHI, DAISUKE
APPLICANT: GARASHI, DAISUKE
APPLICANT: OHSUMA: TETENO FOR PRODUCING TRANSFORMED PLANT HAVING INCREASED GLUTAM
TITLE OF INVENTION: CONTENT
TITLE OF INVENTION: CONTENT
TITLE OF INVENTION: CONTENT
TITLE OF INVENTION: MATHOD FOR PRODUCING TRANSFORMED PLANT HAVING INCREASED GLUTAM
TITLE OF INVENTION: CONTENT
TITLE OF INVENTION: CONTENT
TITLE OF INVENTION NUMBER: US/09/897,056
CURRENT APPLICATION NUMBER: JP 2000-215279
PRIONE RILING DATE: 2000-07-17
NUMBER OF SEQ ID NOS: 11
SOFTWARE: PALENTIN VETSION 3.1
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              27;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       52 PVPRA----VPLSKIJDSFLDGTSSVYLEELQRAWEADPNS--VDESWDNFFRNFVG--- 102
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             188 RKGYPLAKLGNTRAAVNPDTATVDLNVVVDSGRPIAF-GDFEITGTQRYPEQIVSGLARF 246
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                145 OREIPEDLDLAL------YGFTEADLDREFFLGVWQMSGFMSENRPV----Q 186
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         296 VKRHKLETGIRLDSEYGLGGKIAYDYYNLFNKGYIGSVVWDMDKYETTLAAGISQPRNYR 355
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              ---FSGGIWYVRDRAGIDARLGAEFLAEGRK-- 405
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         231 -----YNRERREVILDRLAWSTQFENFLATKWTTAKRFGLE---GGESLIPGMKEM 278
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          106 -----IPGSDIDLGNSHATMLTASWKRQLLNNVLH-------PENGHYL 442
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               993 G-ILIHG------DGSFAGQGVVYETLHLSALPNYTTGGTIHIVVNNQVAFTTDPRAG 443
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      103 -------QAATSPG---ISGQTIQESMRLLLLVRAYQVNG---HMKAKLDPLGLE 144
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       247 QPGTPYDLDLLLDFQQALEQNGHYSGASVQADFDR******LQGDRVPVKVSVTE 295
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   279 FDRAADLGVESIVIGMSHRGRL·····NVLGNVVRKPLRQIFSEFSGGIRPVDEVGYTG 332
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    ------FLSSTALIRTSARAGYFFTPE---NKKL 477
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             333 TGDVKYHLGTSYDRPTRGGKKIHLSLVANPSHLEAADSVVVGKTRAKQYYSNDLDRTKNL 392
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      178 GTFIIRGQAGYTVARDNADVPSGLMFRSGGASSVRGYEL-DSIGLAGPNGSVLPERALLV 536
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     144 RSSQYCTDVAKALSAPIFHVNGDDVE----AVVHACELAAEW---RQTFHSDVVVDLVC 495
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       128 PGPRTKIANVGVAILGDILSDGNLAEYYRNALENWQQPVGSDFDQDSWENSKTSVLGAVT 187
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                537 GSLEYQLPFTRTLSGAVFHDMGDAAANFKRMKLKHGSGLGVRWFSPLAPFSFDIA----
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Indels 175;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Length 1017;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            3.0%; Score 95.5; DB 10;
Similarity 19.0%; Pred. No. 7.1;
04; Conservative 69; Mismatches 200;
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Sequence 5, Application US/09897056
Patent No. US20020100074A1
GENERAL INFORMATION:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               356 GNYWTSNVSYNRSTTQNLEKRA-----
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           ; ORGANISM: Arabidopsis thaliana
US-09-897-056-5
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    443 DGKIGTTLGT------
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us-09-857-669-2.rapb

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446 NNQEVSLTSNAATVSGGAIYATKCTLTGNGSLTFDGNTAGTSGGAIYTETEDFTLTGSTG 505
                                                                                                                                                                                                                                                                 506 TV--TESTNTA-----KTGGALYSKGNNSLS-----GNTNLLFSGNKATGPSNSSANQEG 553
                                                                                                                                                                                                                                                                                                                                                                                   | | | | : : | | : | : | 554 CGGAILSFLESASVSTKKGLMIEDNENVSLSGNTATVSGGAIYATKCALHGNTTLTFDGN 613
                                                                                                                                                                                                        448 TTLGTFLSSTALIRTSARAGYFFTPENKKLGTFIIRGQAGYTVARDNADVPSG----- 500
390 YSKGNSSLTGN---TNLLFSGNKATGPSNSSANQEGCGGAILAFIDSGSVSDKTGLS-IA 445
                                                                   402 EGRKIP----GSDIDLGNSHATMLTASWKRQLL-----NNVLHPENGHY-LDGKIG 447
                                                                                                                                                                                                                                                                                                                                               501 ----LMF-RSGGASSVRGY---ELDSIGLAG-----PNGSVLPERALLVG--SLEYQLP 544
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              TITLE OF INVENTION: Champed Limited
FILE OF INVENTION: Champed Limited
CURRENT FILING DATE: 1999-12-23
FRIOR PULLATION NUMBER: 60/113,280
FRIOR PULLAND DATE: 1998-12-23
FRIOR PULLAND DATE: 1998-12-23
FRIOR PULLAND NUMBER: 60/113,283
FRIOR PULLAND DATE: 1998-12-23
FRIOR PULLING DATE: 1998-12-23
FRIOR APPLICATION NUMBER: 60/113,285
FRIOR PULLAND DATE: 1998-12-23
FRIOR APPLICATION NUMBER: 60/113,285
FRIOR APPLICATION NUMBER: 60/113,285
FRIOR PULLING DATE: 1998-12-23
FRIOR PULLING DATE: 1998-12-28
FRIOR PULLING DATE: 1998-13-28
FRIOR PULLING DA
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   221 NTATDKGGGIYSKEKDSTLDAN-----TGVVTFKSNTAKTGGAWSSDDNLALTGNIQVL 274
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   275 FQENKTTGSAAQANNPEGCGGAICCYLATATDK----TGLAISQNQEMSFTSNTTTANG 329
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            ------GLGGKIAYDYYNLFNKGYIGSVVWDMDKYETTLAA 346
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   330 GAIYATKCTLDGNTTLTFDQNTATAGCGGAIYTETEDFSLKGSTGTVTFSTNTAKTGGAL 389
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    102 MLRSKGYFSSKVSLTEKDGAYTVHITPGPRTKIANVGVAILGDILSDGNLAEYYRNA--- 158
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    NVVVDSGRPIAFGDFEITGTQRYPEQIVSGLARFQPGTPY------DLDLLLLDFQQAL 264
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        EQNGHYSGASVQADFDRLQGDRVPVKVSVTEVKRHKLETGIRLDSEY------ 311
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                347 GISQPRNYRGNYWTSNV--SYNRST---TQNLEKRAFSGGIWYVRDRAGIDARLGAEFLA 401
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Query Match 3.0%; Score 95; DB 10; Length 871;
Best Local Similarity 19.0%; Pred. No. 6.2;
Matches 128; Conservative 84; Mismatches 291; Indels 172; Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                TODSEIKDMVEEHLPLITQQQEEVLDKE-------QTGFLAEE--APDNVKT 101
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  115 ALSFSGFSSLLIDSAPATG----TSGGKGAICVTN-----TEGGTATFTDNASVT 160
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        5 PTALLLPALFFFPHAYAPA-ADLS----ENKAAGFALFKNKSPDTESVKLKPKFPVRID 58
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       6 PWLLTSSALVFSLHPLMAANTDLSSSDNYENGSSGSAAFTAKETSDAS------G 54
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            ; TYPE: PRT
; ORGANISM: Chlamydia pneumoniae
US-09-886-468-21
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                59
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OM protein - protein search, using sw model

November

Run on:

US-09-103-330-26 US-09-435-242-26 US-09-206-942-67 US-09-210-361-4 US-09-710-371-4 US-09-7118-319-6 US-09-118-319-6 US-09-687-147-2 US-09-687-147-2 US-08-613-009A-10 US-08-778-5708-12 US-08-059-584-12 US-08-059-584-12 US-08-074-658-25 US-08-074-658-25 US-08-074-658-25 US-08-074-658-25 US-08-074-658-25 US-08-778-5708-11 US-09-074-658-25 US-08-778-5708-11 108.5 108.5 108.5 108.5 108.1 107.5 107.5 107.5 107.5 107.5 (without alignments) 895.928 Million cell updates/sec 9, 2002, 01:17:44 ; Search time 20 Seconds

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ALIGNMENTS

Sequence

APPLICANT: CHOMAS, Pele
APPLICANT: THOMAS, Wayne
APPLICANT: THOMAS, Wayne
APPLICANT: TANG, Yan Ping
APPLICANT: LOSGURE, Sheena
APPLICANT: LOSGURE, Sheena
APPLICANT: KLEIN, Michel
TITLE OF INVENTION: HEMOPHILUS OUTER MEMBRANE PROTEIN
NUMBER OF SEQUENCES: 55
CORRESPONDENCE ADDRESS:
ADDRESSEE: 61m & McBurney
STREET: 67H Floor, 330 University Avenue
CITY: Toronto
STATE: Ontario
COUNTRY: Canada
ZIP: M5G 1R7 COMPUTER READABLE FORM:
MEDIUM TYPE: Floppy disk
COMPUTER: IBM PC compatible
OPERATING SYSTEM: PC-DOS/MS-DOS Sequence 10, Application US/08433522A Patent No. 6013514 GENERAL INFORMATION:

SOFTWARE: Patentin Release #1.0, Version #1.25 CURRENT APPLICATION DATA: PAPLICATION NUMBER: US/08/433,522A FILING DATE: 12-SEP-1995 CLASSIFICATION: 435 ATTORNEY AGENT INFORMATION:
NAME: STEWARF, Michael I
REGISTRATION NUMBER: 24,973
REFERENCE/DOCKET NUMBER: 1038-434 MIS:jb
TELECOMMUNICATION INFORMATION:

TELEPRAN: (416) 595-1163
TELEPRAN: (416) 595-1163
INFORMATION FOR SEQ ID NO: 10:
SEQUENCE CHARACTERISTICS:
LENGTH: 793 amino acids

TOPOLOGY: linear MOLECULE TYPE: protein TYPE: amino acid US-08-433-522A-10 Match
 Local Similarity
 21.0%; Pred. No. 7.8e-11;
 Conservative
 Mismatches
 139;

SKGYFSSKVSLT-----EKDGA-YTVH1TPGPRTK-----IANVG--VAILGDILSDG 149

105

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24;

1 MMIKPTALLLPALFFFPHAY.....IAYGHSDKKIRWHISLGTRF Total number of hits satisfying chosen parameters: 262574 seqs, 29422922 residues Post-processing: Minimum Match 0% Maximum Match 100% Listing first 45 summaries BLOSUM62 Gapop 10.0 , Gapext 0.5 Issued_Patents_AA:* Minimum DB seq length: 0 Maximum DB seq length: 200000000 US-09-857-669-2 Scoring table: Perfect score: Sequence: Searched: Database

1: /cgg2_6/ptcdata/1/laa/5A_COMB.pep:*
2: /cgn2_6/ptcdata/1/laa/5B_COMB.pep:*
3: /cgn2_6/ptcdata/1/laa/6A_COMB.pep:*
4: /cgn2_6/ptcdata/1/laa/fB_COMB.pep:*
5: /cgn2_6/ptcdata/1/laa/PCTUS_COMB.pep:*
6: /cgn2_6/ptcdata/1/laa/PCTUS_COMB.pep:*

Pred. No. is the number of results predicted by chance to have a score greater than or equal to the score of the result being printed, and is derived by analysis of the total score distribution.

STIMMARTES

		ď			SUMMARIES	
Result No.	Score	Query Match	ouery Match Length	DB	ID	Description
-	213.5	6.7	793	· п	US-08-433-522A-10	Sequence 10, Appl
73	213.5	6.7	793	٣	US-09-135-166-10	
m	213.5	6.7	793	4	US-08-942-046-10	10,
7	210.5	9.9	792	٣	US-08-433-522A-8	
'n	210.5		792	٣	US-09-135-166-8	8
ø	210.5	9.9	792	4	US-08-942-046-8	8
7	209.5	9.9	797	٣	US-08-433-522A-2	Sequence 2, Appli
œ	209.5	9.9	797	٣	US-08-433-522A-4	4
σ	209.5	9.9	797	m	US-08-433-522A-6	9
10	209.5	9.9	797	m	US-09-135-166-2	Sequence 2, Appli
11	209.5	9.9	797	m	US-09-135-166-4	4
12	209.5	9.9	797	Э	US-09-135-166-6	ý
13	209.5	9.9	797	4	US-08-942-046-2	Sequence 2, Appli
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15	209.5	9.9	797	4	US-08-942-046-6	9
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18	114	3.6	461	4	US-09-346-408-8	8
19	113.5	3.6	296	-	US-08-565-386-11	_
20	113	3.6	1365	9	5194600-4	٠,
21	112.5	3.5	508	Н	US-08-021-601-10	Sequence 10, Appl
22	112.5	3.5	508		US-08-082-849B-10	10,
23	112.5	3.5	508	S	PCT-US94-01624-10	Sequence 10, Appl
24	111	3.5	463	4	US-09-346-408-11	11,
25	111	3.5	983	7	US-08-164-292B-26	26,
56	111	3.5	983	m	-08-845-623-	
27	111	3.5	983	m	US-08-815-927-26	76,

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                                                                                                                                                                                                                                                                                                                                                                                             475 KKLGTFIIRGQAGYTVARDNADVPSGLMFRSGGASSVRGYELDSIGLAGPN------ 525
                                                                                                                                                                                                                                                                                                                                                                                                                QNGHYSGASVQADFDRLQG---DRVPVKVSVTEVKRHKLETGIRLDSEYGLGGKIAYDYYN 323
                                                                                                                                                                                                             324 LFNKGYIGSVVWDMDKYETTLAAGISOPR-----NYRGNYWTSNVSYNRS-TTQNLEKR 376
                                                                                                                                                                                                                               | | | :: | :: | :: | 3.46 FLGTGAAVSIAGTKNDYGTSVNLGYTEPYFTKDGVSLGGNIFFENYDNSKSDTSSNYKRT 505
                                                                                                                                                                                                                                                                                              -----GSVLPERALLVGSLEYQLP------FTRT------- 549
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     673 TFNKISSDVIGGNAITTASAELIVPTPFVSDKSQNTVRTSLFVDAASVWNTKWKSDKNGL 732
                                                -TATVDLNVVVDSGRPIAFGDFEITGTQRYPEQIVSGLARFQPGTPYDLDLLLDFQQALE 265
                                                                                                                                                                                                                                                                      377 AFSGGI---WYVRDRAGIDARLG-----AEFLAE------GRKIPGSDIDLG 414
                                                                                                                                                                                                                                                                                                                                  415 NSHATMLTASWKRQLLNNVLHPENGHYLDGKIGTTLGTFLSSTALIRTSARAGYFFTPEN 474
228 NNGYAKAQITKTDVQLNDEKTKVNVTIDVNEGLQYDLRSARIIGNLGGMSAELEPLLSAL 287
                             NLAEYYRNALENWOOPVGSDFDQDSWENSKTSVLGAVTRKGYPLAKLGNTRAAVNPD---
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    TITLE OF INVENTION: HAEMOPHILUS OUTER MEMBRANE PROTEIN
NUMBER OF SEQUENCES: 55
CORRESPONDENCE ADDRESS:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    PatentIn Release #1.0, Version #1.25
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6TH Floor, 330 University Avenue
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  CURRENT APPLICATION DATA:
APPLICATION NUMBER: US/09/135,166
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           GENERAL INFORMATION:
APPLICANT: CHONG, Pele
APPLICANT: THOMAS, Wayne
APPLICANT: YANG, YAN PING
APPLICANT: LOCKHORE, Sheena
APPLICANT: SIA, DWO YUAN CHARLES
APPLICANT: KLEIN, Michel
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        MEDIUM TYPE: Floppy disk
COMPUTER: IBM PC compatible
OPERATING SYSTEM: PC-DOS/MS-DOS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Sequence 10, Application US/09135166 Patent No. 6083743
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          COMPUTER READABLE FORM: MEDIUM TYPE: Floppy
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              RY: Canada
M5G 1R7
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COUNTRY: Canada
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 CLASSIFICATION:
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   228 NNGYAKAQITKTDVQLNDEKTKVNVTIDVNEGLQYDLRSARIIGNLGGMSAELEPLLSAL 287
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      150 NLAEYYRNALENWQQPVGSDFDQDSWENSKTSVLGAVTRKGYPLAKLGNTRAAVNPD--- 206
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            207 -TATVDLNVVVDSGRPIAFGDFEITGTQRYPEQIVSGLARFQPGTPYDLDLLLDFQQALE 265
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     ANKTLAITEVVDAGRRLTVRQLRFEGNTVSADSTLRQEMRQQEGTWYNSQLVELGKIRLD 387
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     QNGHYSGASVQADFDRLQG--DRVPVKVSVTEVKRHKLETGIRLDSEYGLGGKIAYDYYN 323
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           324 LFNKGYIGSVVWDMDKYETTLAAGISQPR-----NYRGNYWTSNVSYNRS-TTQNLEKR 376
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 377 AFSGGI---WYVRDRAGIDARLG-----AEFLAE-------GRKIPGSDIDLG 414
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            550 SGAVFHDMGDAAANFKRMKLKHGSGLGVRWFSPLAPFSFDIA----YGHSDKKIRWHIS 604
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Query Match 6.7%; Score 213.5; DB 3; Best Local Similarity 21.0%; Pred. No. 7.8e-11; Matches 127; Conservative 85; Mismatches 254;
                                                                                                                                                                                  1038-829 MIS: jb
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APPLICATION NUMBER: 08/433,522
                                                                                                                                                                                                                                        TELEPHONE: (416) 595-1155
TELEFAX: (416) 595-1163
INFORMATION FOR SEQ ID NO: 10:
SEQUENCE CHARACTERISTICS:
LENGTH: 793 amino acids
TYPE: amino acid
                                                                                  ATTORNEY/AGENT INFORMATION:
NAME: STEWART, Michael I
REGISTRATION NUMBER: 24,973
REFERENCE/DOCKET NUMBER: 107
TELECOMMUNICATION INFORMATION:
                            12-SEP-1995
                                                                                                                                                                                                                                                                                                                                                                                                                                                    ; MOLECULE TYPE: protein US-09-135-166-10
                                                                                                                                                                                                                                                                                                                                                                                                                                    linear
                                                         CLASSIFICATION:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     605 LGTRF 609
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315 -----GNTTVNSVPDFDDANKTLAITFVVDAGRRLTVHQLRFEGNTVSADSTLRQEMRQQ 369
                     525
                                                 192 PLAKLGNTRAAVNPD----TATVDLNVVVDSGRPIAFGDFEITGTQRYPEQIVSGLARFQ 247
                                                                                                                                                       673 TFNKISSDVIGGNAITTASAELIVPTPFVSDKSQNTVRTSLFVDAASVWNTKWKSDKNGL 732
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Indels 125;
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                     475 KKLGTFIIRGQAGYTVARDNADVPSGLMFRSGGASSVRGYELDSIGLAGPN-
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               TITLE OF INVENTION: HAEMOPHILUS OUTER MEMBRANE PROTEIN
NUMBER OF SEQUENCES: 55
CORRESPONDENCE ADDRESS:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          SYSTEM: PC-DOS/MS-DOS
PatentIn Release #1.0, Version #1.25
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                                                                                                            ----GSVLPERALLVGSLEYQLP------FTRT---
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APPLICATION NUMBER: US/08/433,522A
FILING DATE: 12-SEP-1995
CLASSIFICATION: 435
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  GENERAL INFORMATION:
APPLICANT: CHONG, Pele
APPLICANT: THOMAS, Wayne
APPLICANT: YANG, Yan Ping
APPLICANT: LOOSMORE, Sheena
APPLICANT: SIA, Dwo Yuan Charles
APPLICANT: KLEIN, Michel
                                                                                                                                                                                                                                                                                                                                                                                                                                                   Sequence 8, Application US/08433522A Patent No. 6013514
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                COMPUTER: IBM PC COmpatible OPERATING SYSTEM: PC-DOS/MS-
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  NAME: STEWART, Michael I
REGISTRATION NUMBER: 24,973
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               REFERENCE/DOCKET NUMBER: 10
TELECOMMUNICATION INFORMATION:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         TELEPHONE: (416) 595-1155
TELEFAX: (416) 595-1163
INFORMATION FOR SEQ ID NO: 8:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Sim & McBurney
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               ATTORNEY/AGENT INFORMATION:
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   792 amino acids amino acids
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              TOPOLOGY: linear
; MOLECULE TYPE: protein
US-08-433-522A-8
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   COMPUTER READABLE FORM:
MEDIUM TYPE: Floppy
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STATE: Ontario
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      207 -TATVDLNVVVDSGRPIAFGDFEITGTQRYPEQIVSGLARFQPGTPYDLDLLLDFQQALE 265
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     324 LFNKGYIGSVVWDMDKYETTLAAGISQPR-----NYRGNYWTSNVSYNRS-TTQNLEKR 376
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  506 TYGSNVTLGFPVNENNSYYVGLGHTYNKISNFALEYNRNLYIQSMKFKGNGIKTNDFD-- 563
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     105 SKGYFSSKVSLT-----EKDGA-YTVHITPGPRTK-----IANVG--VAILGDILSDG 149
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   288 HLNDTFRRS-----DIADVENAIKAKLG---ERGY-----GNTTVNSVPDFDD 327
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              328 ANKTLAITEVVDAGRRLTVROLRFEGNTVSADSTLROEMRQOEGTWYNSOLVELGKIRLD 387
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               --GRKIPGSDIDLG 414
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               DB 4; Length 793;
APPLICANT: YANG, Yan Ping
APPLICANT: LOOSMORE, Sheena
APPLICANT: SIA, Dwo Yuan Charles
APPLICANT: KLEIN, Michel
TITLE OF INENTION: HAEMOPHILUS OUTER MEMBRANE PROTEIN
                                                                                                                                                                                                                                                                                                                                    MEDIUM TYPE: Floppy disk
COMPUTER: IBM PC compatible
OPERATING SYSTEM: PC-DOS/MS-DOS
SOFTWARE: Patentin Release #1.0, Version #1.25
CURRENT APPLICATION DATA:
APPLICATION NUMBER: US/08/942,046
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Mismatches 254;
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                                                                                                                                                                          ADDRESSEE: Sim & McBurney
STREET: GTH Floor, 330 University Avenue
CITY: Toronto
STATE: Ontario
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21.0%; Pred. No. 7.8
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PRIOR APPLICATION DATA:
APPLICATION NUMBER: 08/433,522
FILING DATE: 12-SEP-1995
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     NAME: STEWART, Michael I
REGISTRATION NUMBER: 24,973
REFERENCE/DOCKET NUMBER: 10
TELECOMMUNICATION INFORMATION:
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INFORMATION FOR SEQ ID NO: 10:
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amino acid
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MOLECULE TYPE: protein
                                                                                                                                                                                                                                                                                                          COMPUTER READABLE FORM:
MEDIUM TYPE: Floppy
                                                                                                                                                     CORRESPONDENCE ADDRESS:
                                                                                                                                                                                                                                                                  COUNTRY: Canada
ZIP: M5G 1R7
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                                                                                                                                                                     ADDRESSEE:
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                                                        488 FENYDNSKSDTSSNYKRTTYGSNVTLGFPVNENNSYYVGLGHTYNKISNFALEYNRNLYI 547
                                                                                                                                                                                                                                                              548 QSMKFKGNOIKTNDFD-----FSFGWNYNSLNRGYFPTKG--VKASLGGRVTIPGSD 597
                                                                                                                                                                                                                                                                                                      457 TALIRTSARAGYFFTPENKKLGTFIIRGQAGYTVARDNADVPSGLMFRSGGASSVRGYEL 516
                                                                                                                                                                                                                                                                                                                                                                       517 DSIGLAGPN------FTRT---- 548
                                 PGTPYDLDLLLDFQQALEQNGHYSGASVQADFDRLQG-.DRVPVKVSVTEVKRHKLETGI 305
                                                                                                  306 RLDSEYGLGGKIAYDYYNLFNKGYIGSVVWDMDKYETTLAAGISQPR-----NYRGNYW 359
                                                                                                                                 428 GYGTESGISYQASVKQDNFLGTGAAVSIAGTKNDYGTSVNLGYTEPYFTKDGVSLGGNVF 487
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                                                                                                                                                                    360 TSNVSYNRS-TTQNLEKRAFSGGI---WYVRDRAGIDARLG-----AEFLAE----
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          GENERAL INFORMATION:
GENERAL INFORMATION:
APPLICANT: CHOMAS, Wayne
APPLICANT: THOMAS, Wayne
APPLICANT: TOOSHORE, Sheena
APPLICANT: LOCSHORE, Sheena
APPLICANT: SIA, DOW YUAN Charles
APPLICANT: KLEIN, MICHAI
TITLE OF INVENTION: HAEMOPHILUS OUTER MEMBRANE PROTEIN
NUMBER OF SEQUENCES: 55
CORRESPONDENCE ADDRESS:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       SYSTEM: PC-DOS/MS-DOS
PatentIn Release #1.0, Version #1.25
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STREET: 6TH Floor, 330 University Avenue
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APPLICATION NUMBER: US/09/135,166
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APPLICATION NUMBER: 08/433,522
FILING DATE: 12-SEP-1995
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Sequence 8, Application US/09135166
Patent No. 6083743
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ZIP: M5G IR7
COMPUTER READABLE FORM:
MEDLUM TYPE: Floppy disk
MEDLUM TYPE: Floppy disk
PC Compatible
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REGISTRATION NUMBER: 24,973
REFERENCE/DOCKET NUMBER: 105
TELECOMMUNICATION:
TELEPHONE: (416) 595-1155
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STATE: Ontario
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                                                                                                                                                                                                                                                                                                            192 PLAKLGNTRAAVNPD----TATVDLNVVVDSGRPIAFGDFEITGTQRYPEQIVSGLARFQ 247
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                                                                                                                                                                                                 134 IANVG--VAILGDILSDGNLAEYYRNALENWQOPVGSDFDQDSWENSKTSVLGAVTRKGY 191
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     188 FENYDNSKSDTSSNYKRTTYGSNVTLGFPVNENNSYYVGLGHTYNKISNPALEYNRNLYI
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                                                                                                                                             Indels 125;
                                                                                      Length 792;
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APPLICANT: CHONG, Pele
APPLICANT: THOMAS, Wayne
APPLICANT: TOSMORE, Sheena
APPLICANT: LOCSMORE, Sheena
APPLICANT: SIA, DAO Yuan Charles
APPLICANT: SIA, Michel
TITLE OF INVENTION: HAEMOPHILUS OUTER MEMBRANE PROTEIN
NUMBER OF SEQUENCES: 55
CORRESPONDENCE ADDRESS:
ADDRESSEE: SIM & MCBULNEY.
                                                                                      DB 3;
                                                                                      Score 210.5; DB 3;
Pred. No. 1.5e-10;
5; Mismatches 241;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                STREET: SIM & MCBurney.
STREET: GTH FLOOR, 330 University Avenue
STRY: Toronto
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  US-08-942-046-8; Sequence 8, Application US/08942046; Patent No. 6264954
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                                                                                                                                             75;
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                                                                                      Similarity 21.5%;
                                                                                                                                             Conservative
; MOLECULE TYPE: protein US-09-135-166-8
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Similarity
                                                                        GENERAL INFORMATION:
                                                                                                                                                                                                                                                                                 CITY: Toronto
                     US-08-433-522A-2
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         US-08-433-522A-2
                                                                                                                                                                                                                                                                 STREET:
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   488 FENYDNSKSDTSSNYKRTTYGSNVTLGFPVNENNSYYVGLGHTYNKISNFALEYNRNLYI 547
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               -----GRKIPGSDIDLGNSHATMLTASWKROLLNNVLHPENGHYLDGKIGTTLGTFLSS 456
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 457 TALIRTSARAGYFFTPENKKLGTFIIRGAGYTVARDNADVPSGLMFRSGGASSVRGYEL 516
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         : || : | | :|| |:||: 598 NKYYKLSADVQGFYPLDRDHLWVVSAKASAGYANGFGNKRLPFYQTYTAGGIGSLRGFAY 657
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      DSIGLAGPN------FTRT---- 5SVLPERALLVGSLEYQLP-------FTRT---- 548
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               192 PLAKLGNTRAAVNPD----TATVDLNVVVDSGRPIAFGDFEITGTQRYPEQIVSGLARFQ 247
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   248 PGTPYDLDLLLDFQQALEQNGHYSGASVQADFDRLQG--DRVPVKVSVTEVKRHKLETGI 305
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       306 RLDSEYGLGGKIAYDYYNLFNKGYIGSVVWDMDKYETTLAAGISQPR-----NYRGNYW 359
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 548 OSMKFKGNGIKTNDFD-----FSFGWNYNSLNRGYFPTKG--VKASLGGRVTIPGSD 597
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            134 IANVG--VAILGDILSDGNLAEYYRNALENWQQPVGSDFDQDSWENSKTSVLGAVTRKGY 191
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             DB 4; Length 792;
                                                                    SOFTWARE: Patentin Release #1.0, Version #1.25
CURRENT APPLICATION DATA:
APPLICATION NUMBER: US/08/942,046
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Ouery Match 6.6%; Score 210.5; DB 4; Best Local Similarity 21.5%; Pred. No. 1.5e-10; Matches 121; Conservative 75; Mismatches 241;
                                                                                                                                                                                                                                                                               1038-732 MIS: jb
COMPUTER READABLE FORM:
MEDIUM TYPE: Floppy disk
COMPUTER: IBM PC compatible
OPERATING SYSTEM: PC-DOS/MS-DOS
                                                                                                                                                                           08/433,522
                                                                                                                                                                                                                        ATTORNEY AGENT INFORMATION:
NAME: STEWART, Michael I
REGISTRATION UNDHER: 24,973
REFERENCE/DOCKET UNDHER: 1038
TELECOMMUNICATION INFORMATION:
TELEFONE: (416) 595-1155
TELEFAX: (416) 595-1163
INFORMATION FOR SEQ ID NO: 8:
SEQUENCE CHARACTERISTICS:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  772 PIKKYENDDVE-QPQFSIGGSF 792
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               592 ---- YGHSDKKIRWHISLGTRF 609
                                                                                                                   FILING DATE:
CLASSIFICATION: 435
PRIOR APPLICATION DATA:
APPLICATION NUMBER: 08/433
FILING DATE: 12-SEP-1995
CLASSIFICATION: 435
                                                                                                                                                                                                                                                                                                                                                                                    LENGTH: 792 amino acids TYPE: amino acid
                                                                                                                                                                                                                                                                                                                                                                                                                                       ; MOLECULE TYPE: protein US-08-942-046-8
                                                                                                                                                                                                                                                                                                                                                                                                                          linear
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184 ESVSSSTLQEQMELQPDSWWKLWGNKFEGAQFEKDLQSIRDYYLNNGYAKAQITKTDVQL 243
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      282 LQC--DRVPVKVSVTEVKRHKLETGIRLDSEYGLGGKIAYDYYNLFNKGYIGSVVWDMDK 339
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           340 YETTLAAGISQPR-----NYRGNYWTSNVSYNRS-TTQNLEKRAFSGGI---WYVRDRA 389
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          DSEIKDMVEEHLPLITQQQEEVLDKEQTGFLAEEAPDNVKTMLRSKGYFSSKVSLT---- 116
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               166 VGSDFDQDSWENSKTSVLGAVTRKGYPLAKLGNTRAAVNPD----TATVDLNVVVDSGRP 221
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 222 IAFGDFEITGTQRYPEQIVSGLARFQPGTPYDLDLLLDFQQALEQNGHYSGASVQADFDR 281
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Indels 137;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Length 797;
                                                                                             APPLICANT: THOMAS, Wayne
APPLICANT: YANG, Yan Ping
APPLICANT: YANG, Yan Ping
APPLICANT: LOOSMORE, Sheena
APPLICANT: LOOSMORE, Sheena
APPLICANT: KLEIN, Michel
TITLE OF INVENTION: HAEMOPHILUS OUTER MEMBRANE PROTEIN
WUMBER OF SEQUENCES: 55
CORRESPONDENCE ADDRESS:
ADDRESSEE: Sim & McBurney
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      SOFTWARE: Patentin Release #1.0, Version #1.25 CURRENT APPLICATION DATA: PAPLICATION NUMBER: US/08/433,522A FILING DATE: 12-SEP-1995 CLASSIFICATION: 435
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Matches 130; Conservative 103; Mismatches 280;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        DB 3;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     6.6%; Score 209.5; DB 3 20.0%; Pred. No. 1.9e-10;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              1038-434 MIS: jb
                                                                                                                                                                                                                                                                                                                                 6TH Floor, 330 University Avenue
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            COMPUTER: IBM PC compatible OPERATING SYSTEM: PC-DOS/MS-DOS
; Sequence 2, Application US/08433522A
; Patent No. 6013514
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        ATTORREY/AGERT INFORMATION:
NAME: STEWART, Michael I
REGISTRATION NUMBER: 24,973
REFERENCE/DOCKET NUMBER: 10
TELECOMMUNICATION INFORMATION:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     TELEPHONE: (416) 595-1155
TELEFAX: (416) 595-1163
INFORMATION FOR SEQ ID NO: 2:
SEQUENCE CHARACTERISTICS:
LENGTH: 797 amino acids
TYPE: amino acid
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Floppy disk
                                                                                                                                                                                                                                                                                                                                                                               STATE: Ontario
COUNTRY: Canada
ZIP: MSG 1R7
COMPUTER READABLE FORM:
MEDIUM TYPE: Floppy di
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MOLECULE TYPE: protein
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117 -- EKDGA-YTVHITPGPRTK-----IANVG--VAILGDILSDGNLAEYYRNALENWQQP 165
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NAME: STEWART, Michael I
REGISTRATION NUMBER: 24,973
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N: 435
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ZIP: MSG 1R7
COMPUTER READABLE FORM:
MEDIUM TYPE: Floppy of
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         NUMBER OF SEQUENCES: ECORRESPONDENCE ADDRESS:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 CITY: Toronto
STATE: Ontario
COUNTRY: Canada
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        FILING DATE:
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                                                                                                                                                                              632 GFGNKRLPFYQTYTAGGIGSLRGFAYGSI --- GPNAIYAEYGNGSGTGTFKKISSDVIGG 688
 --GRKIPGSDIDLGNSHATMLTASWKROLL 430
                                                                        NNVLHPENGHYLDGKIGTTLGTFLSSTALIRTSARAGYFFTPENKKLGTFIIRGQAGYTV 490
                                                                                                        574 NRGYFPTKG--VKASLGGRVTIPGSDNKYYKLSADVQGFYPLDRDHLWVVSAKASAGYAN 631
                                                                                                                                              --GSVLPE 531
                                                                                                                                                                                                                      567
                                                                                                                                                                                                                                                    NAIATASAELIVPTPFVSDKSQNTVRTSLFVDAASVWNTKWKSDKNGLESDVLKRLPDYG 748
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    DSEIKDMVEEHLPLITQQQEEVLDKEQTGFLAEEAPDNVKTMLRSKGYFSSKVSLT---- 116
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         ESVSSSTLQEQMELQPDSWWKLMGNKFEGAQFEKDLQSIRDYXLNNGYAKAQITKTDVQL 243
                                                                                                                                                                                                                    RALLVGSLEYQLP-----FTRTLSGAVFHDM------GDAAANFKRM----
                                  SYYVGLGHTYNKISNFALEYNRNLYIQSMKFKGNGIKTNDFD-----FSFGWNYNSL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Indels 137;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                DB 3; Length 797;
                                                                                                                                                                                                                                                                                          ---KLKHGSGLGVRWFSPLAPFSFDIA----YGHSDKKIRWHISLGTRF 609
                                                                                                                                                                                                                                                                                                               KSSRIRASTGVGFQWQSPIGPLVFSYAKPIKKYENDDVE-QFQFSIGGSF 797
                                                                                                                                                                                                                                                                                                                                                                                                                                                                        APPLICANT: CHONG, Pele
APPLICANT: THOMAS, Wayne
APPLICANT: YANG, Yan Ping
APPLICANT: SIA, Dwo Yuan Charles
APPLICANT: SIA, Dwo Yuan Charles
APPLICANT: KLEIN, Michel
TITLE OF INVENTION: HERMOPHILUS OUTER MEMBRANE PROTEIN
NUMBER OF SEGUENCES: 55
CORRESPONDENCE ADDRESS:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        SOFTWARE: Patentin Release #1.0, Version #1.25
CURRENT APPLICATION DATA:
APPLICATION NUMBER: US/08/433,522A
FILING DATE: 12-SEP-1995
CLASSIFICATION: 435
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            6.6%; Score 209.5; DB 3;
nilarity 20.0%; Pred. No. 1.9e-10;
Conservative 103; Mismatches 280;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           E: Sim & McBurney
6TH Floor, 330 University Avenue
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           1038-434 MIS: 1b
                                                                                                                                            491 ARDNADVPSGLMFRSGGASSVRGYELDSIGLAGPN-
                                                                                                                                                                                                                                                                                                                                                                                                                     Sequence 4, Application US/08433522A Patent No. 6013514
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               COUNTRY: Canada
ZIP: M5G 1R7
COMPUTER READABLE FORM:
MEDIUM TYPE: Floppy disk
COMPUTER: IBM PC COMPALIDLE
OPERATING SYSTEM: PC-DOS/MS-DC
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    REFERENCE/OOCKET NUMBER: 1038
TELECOMUNICATION INFORMATION:
TELEPHONE: (416) 595-1155
TELEFAX: (416) 595-1163
INFORMATION FOR SEO ID NO: 4:
SEQUENCE CHRRACTERISTICS:
LENGTH: 797 annino acids
TYPE: amino acid
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NAME: STEWART, Michael I
REGISTRATION NUMBER: 24,973
390 GIDARLG-----AEFLAE-
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MOLECULE TYPE: protein
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Best Local Similarity
Matches 130; Conserva
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         ADDRESSEE: Sim & STREET: 6TH Floc CITY: Toronto STATE: Ontarlo
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522 SYYVGLGHTYNKISNFALEYNRNLYIQSMKFKGNGIKTNDFD------FSFGWNYNSL 573
                                                                                                                        ----DIADVENAIKAKLG---ERGYGSATVNSV-----PDFDDANKTLAITLVVDAGRR 343
                                                                                                                                                                                                                                                    282 LQG--DRVPVKVSVTEVKRHKLETGIRLDSEYGLGGKIAYDYYNLFNKGYIGSVVWDMDK 339
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                                                                                                                                                                                                         222 IAFGDFEITGTQRYPEQIVSGLARFQPGTPYDLDLLLDFQQALEQNGHYSGASVQADFDR 281
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                                                                                    166 VGSDFDQDSWENSKTSVLGAVTRKGYPLAKLGNTRAAVNPD----TATVDLNVVVDSGRP
568 ---KLKHGSGLGVRWFSPLAPFSFDIA----YGHSDKKIRWHISLGTRF 609
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Sequence 6, Application US/08433522A
Patent No. 6013514
GENERAL INFORMATION:
GENERAL INFORMATION:
GENERAL THOMAS, Wayne
APPLICANT: THOMAS, Wayne
APPLICANT: YANG, Yan Ping
APPLICANT: LOCSMORE, Sheena
APPLICANT: SIA, Doo Yuan Charles
APPLICANT: KLEIN, Michel
TITLE OF INVENTION: HAEMOPHILUS OUTER MEMBRANE PROTEIN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            SOFTWARE: Patentin Release #1.0, Version #1.25 CURRENT APPLICATION DATA:
APPLICATION NUMBER: US/08/433,522A
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STREET: 6TH Floor, 330 University Avenue
CITY: Toronto
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COMPUTER: IBM PC compatible
OPERATING SYSTEM: PC-DOS/MS-DOS
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-----DIADVENAIKAKLG---ERGYGSATVNSV-----PDFDDANKTLAITLVVDAGRR 343
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Matches 130; Conservative 103; Mismatches 280;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            DB 3;
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                                                                ADDRESSEE: Sim & McBurney
STREET: 6TH Floor, 330 University Avenue
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APPLICATION NUMBER: US/09/135,166
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ATTORNEY/AGENT INFORMATION:
NAME: STEWART, Michael I
REGISTRATION NUMBER: 24,973
REFERENCE/DOCKET NUMBER: 1038
TELECOMMUNICATION INFORMATION:
                                                                                                                                                                                                                                                                                      E: Floppy disk
IBM PC compatible
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     TELEPHONE: (416) 595-1155
TELEFAX: (416) 595-1163
INFORMATION FOR SEQ ID NO: 2.
SEQUENCE CHARACTERISTICS:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        CLASSIFICATION:
PRIOR APPLICATION DATA:
APPLICATION NUMBER: 08/4:
FILING DATE: 12-SEP-1995
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amino acid
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                                                                                                                                                                                                                                                         COMPUTER READABLE FORM: MEDIUM TYPE: Floppy
                                          CORRESPONDENCE ADDRESS:
         NUMBER OF SEQUENCES:
                                                                                                                                                                                                                                                                                                                                                   OPERATING SYSTEM:
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                                                                                                                                                                                           COUNTRY: Canada
ZIP: M5G 1R7
                                                                                                                                 CITY: Toronto
STATE: Ontario
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                --EKDGA-YTVHITPGPRTK-----IANVG--VAILGDILSDGNLAEYYRNALENWQQP 165
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        166 VGSDFDQDSWENSKTSVLGAVTRKGYPLAKLGNTRAAVNPD----TATVDLNVVVDSGRP 221
                                                                                                                                                                                                                                                                                                                                                                                                                                                 Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       ---GDAAANFKRM----
                                                                                                                                                                                                                                                                                                                                                                                                                                           Indels 137;
                                                                                                                                                                                                                                                                                                                                                                                Length 797;
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APPLICANT: CHONG, Pele
APPLICANT: THOMAS, Wayne
APPLICANT: TANG, Yan Ping
APPLICANT: LOCSWORE, Sheena
APPLICANT: SIA, Dwo Yuan Charles
APPLICANT: SIA, Dwo Yuan Charles
APPLICANT: SIA, Matchel
TITLE OF INVENTION: HAEMOPHILUS OUTER MEMBRANE PROTEIN
                                                                                                                                                                                                                                                                                                                                                                             Query Match 6.6%; Score 209.5; DB 3; Best Local Similarity 20.0%; Pred. No. 1.9e-10; Matches 130; Conservative 103; Mismatches 280;
REFERENCE/DOCKET NUMBER: 1038-434 MIS:jb
TELECOMMUNICATION INFORMATION:
TELEPHONE: (416) 595-1155
TELEFAX: (416) 595-1163
INFORMATION FOR SEQ ID NO: 6:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          RALLVGSLEYQLP ---- FTRTLSGAVFHDM ---
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Patent No. 6083743
                                                                                                                                                        SEQUENCE CHARACTERISTICS:
LENGTH: 797 amino acids
TYPE: amino acid
                                                                                                                                                                                                                                               TOPOLOGY: linear

MOLECULE TYPE: protein

US-08-433-522A-6
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282 LQG--DRVPVKVSVTEVKRHKLETGIRLDSEYGLGGKIAYDYYNLFNKGYIGSVVWDMDK 339
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                                                                                                               344 LTVROLRFEGNTVSADSTLROEMRQQEGTWYNSQLVELGKIRLDRTGFFE--TVENRIDP 401
                                                                                                                                                                                                                                                 340 YETTLAAGISQPR----NYRGNYWTSNVSYNRS-TTQNLEKRAFSGGI---WYVRDRA 389
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                                                                   222 IAFGDFEITGTQRYPEQIVSGLARFQPGTPYDLDLLLDFQQALEQNGHYSGASVQADFDR
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APPLICANT: CHONG, Pele
APPLICANT: THOWAS, Wayne
APPLICANT: TANG, Yan Ping
APPLICANT: YANG, Yan Ping
APPLICANT: SIA, Dwo Yuan Charles
APPLICANT: KLEIN, Michel
TITLE OF INVENTION: HAEMOPHILUS OUTER MEMBRANE PROTEIN
NUMBER OF SEQUENCES: 55
CORRESPONDENCE ADDRESS:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    PatentIn Release #1.0, Version #1.25
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NAME: STEWARF, Michael 1
REGISTATION NUMBER: 24,973
REFERENCE/DOCKET NUMBER: 1038-829 MIS:jb
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          ADDRESSEE: Sim & McBurney
STREET: 6TH Floor, 330 University Avenue
CITY: Toronto
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    SOFTWARE: Patentin Release #1.0, CURRENT APPLICATION DATA: APPLICATION NUMBER: US/09/135,166
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MEDIUM TYPE: Floppy disk
COMPUTER: IBM PC compatible
OPERATING SYSTEM: PC-DOS/MS-DOS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          CLASSIFICATION:
PRIOR APPLICATION DATA:
APPLICATION NUMBER: 08/433,522
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Sequence 6, Application US/09135166
Patent No. 6083743
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           12-SEP-1995
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ZIP: M5G 1R7
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NAIATASAELIVPTPFVSDKSQNTVRTSLFVDAASVWNTKWKSDKNGLESDVLKRLPDYG 748
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             --EKDGA-YTVHITPGPRTK-----IANVG--VAILGDILSDGNLAEYYRNALENWQQP 165
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   166 VGSDFDQDSWENSKTSVLGAVTRKGYPLAKLGNTRAAVNPD----TATVDLNVVVDSGRP 221
                                                              RALLVGSLEYQLP-----FTRTLSGAVFHDM-------GDAAANFKRM----
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                                                                                                                                                      568 ---KLKHGSGLGVRWFSPLAPFSFDIA----YGHSDKKIRWHISLGTRF 609
                                                                                                                                                                                    749 KSSRIRASTGVGFQWQSPIGPLVFSYAKPIKKYENDDVE-QFQFSIGGSF 797
                                                                                                                                                                                                                                                                                                                                                                                                APPLICANT: THOMAS, Wayne
APPLICANT: YANG, Yan Ping
APPLICANT: LOOSWORE, Sheena
APPLICANT: SIA, Dwo Yuan Charles
APPLICANT: KLEIN, Michal
TITLE OF INVENTION: HAEMOPHILUS OUTER MEMBRANE PROTEIN
NUMBER OF SEQUENCES: 55
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      SOFTWARE: Patentin Release #1.0, Version #1.25
CURRENT APPLICATION DATA:
APPLICATION NUMBER: US/09/135,166
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Ouery Match 6.6%; Score 209.5; DB 3; Best Local Similarity 20.0%; Pred. No. 1.9e-10; Matches 130; Conservative 103; Mismatches 280;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   ADDRESSEE: Sim & McBurney
STREET: 6TH Floor, 330 University Avenue
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              1038-829 MIS:jb
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     PRIOR APPLICATION DATA:
APPLICATION NUMBER: 08/433,522
FILING DATE: 12-SEP-1995
                                                                                                                                                                                                                                                                                                             Sequence 4, Application US/09135166
Patent No. 6083743
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             NAME: STEWART, MIChael I
REGISTRATION NUMBER: 24,973
REFRENCE/DOCKET NUMBER: 1038
TELECOMMUNICATION INFORMATION:
TELEPHONE: (416) 595-1155
TELEFAX: (416) 595-1163
INFORMATION FOR SEQ ID NO: 4:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          MEDIUM TYPE: Floppy disk
COMPUTER: IBM PC COMPATIBLE
OPERATING SYSTEM: PC-DOS/MS-
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             ATTORNEY/AGENT INFORMATION:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  SEQUENCE CHARACTERISTICS:
LENGTH: 797 amino acids
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MOLECULE TYPE: protein

US-09-135-166-4
                                                                                                                                                                                                                                                                                                                                                                                  CHONG, Pele
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  COMPUTER READABLE FORM: MEDIUM TYPE: Floppy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            CORRESPONDENCE ADDRESS:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    i: Ontario
RY: Canada
M5G 1R7
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STREET: 01..
TTY: Toronto
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      CLASSIFICATION:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           FILING DATE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    STATE: O
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US-09-135-166-4
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491 ARDNADVPSGLMFRSGGASSVRGYELDSIGLAGPN--------GSVLPE 531
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amino acid
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MOLECULE TYPE: protein
                                                                                                         COMPUTER READABLE FORM MEDIUM TYPE: Floppy
 CORRESPONDENCE ADDRESS
                          STREET: 6TH FLUGA, CITY: Toronto STATE: Ontario COUNTRY: Canada ZIP: M56 1R7
                                                                                                                                          COMPUTER: IBM PC OPERATING SYSTEM:
                                                                                                                                                                                                                         FILING DATE:
                  ADDRESSEE:
                                                                                                                                                                                                                                                                                                                                                                                                                                                              LENGTH:
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       -----DIADVENAIKAKLG---ERGYGSATVNSV-----PDFDDANKTLAITLYVDAGRR 343
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           340 YETTLAAGISQPR----NYRGNYWTSNVSYNRS-TTQNLEKRAFSGGI---WYVRDRA 389
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             522 SYYVGLGHTYNKISNFALEYNRNLYIQSMKFKGNGIKTNDFD-----FSFGWNYNSL 573
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   431 NNVLHPENGHYLDGKIGTTLGTFLSSTALIRTSARAGYFFTPENKKLGTFIIRGQAGYTV 490
                                                                                                                                                                                                                                     DSEIKDMVEEHLPLITQQQEEVLDKEQTGFLAEEAPDNVKTMLRSKGYFSSKVSLT---- 116
                                                                                                                                                                                                                                                                                                  117 -- EKDGA-YTVHITPGPRTK-----IANVG--VAILGDILSDGNLAEYYRNALENWQQP 165
                                                                                                                                                                                                                                                                                                                                                                166 VGSDFDQDSWENSKTSVLGAVTRKGYPLAKLGNTRAAVNPD----TATVDLNVVVDSGRP 221
                                                                                                                                                                                                                                                                                                                                                                                                                             IAFGDFEITGTQRYPEQIVSGLARFQPGTPYDLDLLLDFQQALEQNGHYSGASVQADFDR 281
                                                                                                                                                                                                                                                                                                                                                                                                                                                   : : | | | | | : | : | : | : | 344 LIVRQLRFEGNTVSABSTLRQEMRQQEGTWYNSQLVELGKIRLDRTGFFE--TVENRIDP 401
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Gaps
                                                                                                                                                                                                                                                                                                                       532 RALLVGSLEYQLP-----FTRTLSGAVFHDM-------GDAAANFKRM----
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                                                                                                                                                                                                       Indels 137;
                                                                                                                                                                        Length 797;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              568 ---KLKHGSGLGVRWFSPLAPFSFDIA----YGHSDKKIRWHISLGTRF 609
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Query Match 6.6%; Score 209.5; DB 3; Best Local Similarity 20.0%; Pred. No. 1.9e-10; Matches 130; Conservative 103; Mismatches 280;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   491 ARDNADVPSGLMFRSGGASSVRGYELDSIGLAGPN------
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Patent No. 6264954
GENERAL INFORMATION:
           TELEPHONE: (416) 595-1155
TELEFAX: (416) 595-1163
INFORMATION FOR SEQ ID NO: 6: SEQUENCE CHARACTERISTICS:
LENGTH: 797 amino acids
TYPE: amino acid
TOPOLOGY: linear
MOLECULE TYPE: protein
US-09-135-166-6
TELECOMMUNICATION INFORMATION:
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US-08-942-046-2
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        --EKDGA-YTVHITPGPRTK-----IANVG--VAILGDILSDGNLAEYYRNALENWQQP 165
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       VGSDFDQDSWENSKTSVLGAVTRKGYPLAKLGNTRAAVNPD----TATVDLNVVVDSGRP 221
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           222 IAFGDFEITGTQRYPEQIVSGLARFQPGTPYDLDLLLDFQQALEQNGHYSGASVQADFDR 281
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                                                                                                                                                                                                                                                                                                              SOFTWARE: Patentin Release #1.0, Version #1.25
CURRENT APPLICATION DATA:
APPLICATION NUMBER: US/08/942,046
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Ouery Match 6.6%; Score 209.5; DB 4; Best Local Similarity 20.0%; Pred. No. 1.9e-10; Matches 130; Conservative 103; Mismatches 280;
3: Sim & McBurney
6TH Floor, 330 University Avenue
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                                                                                                                                                                                                                                                                                                                                                                                                                               CLASSIFICATION: 435
PRIOR APPLICATION: 435
PRIOR APPLICATION DATA:
APPLICATION NUMBER: 084433,522
FILING DATE: 12-SEP-1995
CLASSIFICATION: 435
ATTORNEY/AGENT INFORMATION:
NAME: STEWART, MICHAELI
REGISTRATION NUMBER: 24,973
REFERENCE/DOCKET NUMBER: 1038-73;
TELEPHONE: (416) 595-1155
TELEPHONE: (416) 595-1163
SEQUENCE CHARACTERISTICS:
SEQUENCE CHARACTERISTICS:
SEQUENCE CHARACTERISTICS:
                                                                                                                                                                                                                                                  IBM PC compatible
SYSTEM: PC-DOS/MS-DOS
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390 GIDARLG-----AEFLAE*-----GRKIPGSDIDLGNSHATMLTASWKRQLL 430
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    ----DIADVENAIKAKLG---ERGYGSATVNSV----+PDFDDANKTLAITLVVDAGRR 343
                                                                                                                          LQG--DRVPVKVSVTEVKRHKLETGIRLDSEYGLGGKIAYDYYNLFNKGYIGSVVWDMDK 339
                                                                                                                                                                                                                                      689 NAIATASAELIVPTPFVSDKSONTVRTSLFVDAASVWNTKWKSDKNGLESDVLKRLPDYG 748
                                                                                                                                                      344 LIVRQLRFEGNIVSADSTLRQEMRQQEGTWYNSQLVELGKIRLDRTGFFE--TVENRIDP
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                                                                                                                                                                                                            340 YETTLAAGISQPR----NYRGNYWTSNVSYNRS-TTQNLEKRAFSGGI---WYVRDRA
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APPLICANT: THOMAS, Wayne
APPLICANT: TANDAS, Wayne
APPLICANT: YANG, Yan Ping
APPLICANT: SIA, Dwo Yuan Charles
APPLICANT: KLEIN, Michel
APPLICANT: KLEIN, Michel
TITLE OF INVENTION: HAEMOPHILUS OUTER MEMBRANE PROTEIN
NUMBER OF SOUGHNESS: 55
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IBM PC compatible
SYSTEM: PC-DOS/MS-DOS
PatentIn Release #1.0, Version #1.25
                                                                                                                                                                                                                                                                                                                                                                                                                                                              491 ARDNADVPSGLMFRSGGASSVRGYELDSIGLAGPN----
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RR: 1038-732 MIS:jb
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6TH Floor, 330 University Avenue
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APPLICATION NUMBER: US/08/942,046
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Patent No. 6264954
GENERAL INFORMATION:
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NAME: STEWART, MICHAEL I
REGISTRATION NUMBER: 24,973
REFERENCE/DOCKET NUMBER: 10
TELECOMMUNICATION INFORMATION:
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APPLICATION NUMBER: 08/4:
FILING DATE: 12-SEP-1995
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CLASSIFICATION: 435
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COUNTRY: Canada
ZIP: MSG 1R7
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632 GFGNKRLPFYQTYTAGGIGSLRGFAYGSI -- - GPNAIYAEYGNGSGTGTFKKISSDVIGG 688
                                                                             689 NAIATASAELIVPTPFVSDKSONTVRTSLFVDAASVWNTKWKSDKNGLESDVLKRLPDYG 748
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                                           --GDAAANFKRM----
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                                                                                                                                                568 ---KLKHGSGLGVRWFSPLAPFSFDIA----YGHSDKKIRWHISLGTRF 609
                                                                                                                                                                                                                                                                                                         GENERAL INFORMATION:
APPLICANT: CHOMS, Wele
APPLICANT: THOMAS, Wayne
APPLICANT: TOOSMORE, Sheena
APPLICANT: SIA, Dwo Yuan Charles
APPLICANT: KLEIN, Michel
TITLE OF INFORTON: HABMOPHILUS OUTER MEMBRANE PROTEIN
NUMBER OF SEQUENCES: 55
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    SOFTWARE: Patentin Release #1.0, Version #1.25 CURRENT APPLICATION DATA:
APPLICATION NUMBER: US/08/942,046
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      DB 4;
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           FILING DATE: 12-SEP-1995
CLASSIFICATION: 435
ATORNEY AGENT INFORMATION:
NAME: STEWART, Michael I
REGISTRATION NUMBER: 24,973
REFERENCE/DOCKET NUMBER: 1038-732 MIS: 3b
TELECOMMUNICATION INFORMATION:
                                      532 RALLVGSLEYQLP-----FTRTLSGAVFHDM----
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          ADDRESSEE: Sim & McBurney
STREET: 6TH Floor, 330 University Avenue
CITY: Toronto
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          APPLACATE:
FILING DATE:
CLASSIFCATION: 435
CLASSIFCATION DATA:
PRIOR APPLICATION DATA:
APPLICATION NUMBER: 08/433,522
APPLICATION NUMBER: 08/433,522
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COMPUTER: IBM PC compatible
OPERATING SYSTEM: PC-DOS/MS-DOS
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         TELEPHONE: (416) 595-1155
TELEFAX: (416) 595-1163
INFORMATION FOR SEO ID NO: 4:
SEQUENCE CHARACTERISTICS:
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amino acid
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         ; TOPOLOGY: linear
; MOLECULE TYPE: protein
US-08-942-046-4
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ZIP: MSG 1R7
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                                                                                                                                                                                                                              RESULT 14
US-08-942-046-4
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, ORGANISM: Glycine max US-09-346-408-6
                                                                  LENGTH: 465
TYPE: PRT
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                                                                                                                                                                                                                                                                                                  --EKDGA-YTVHITPGPRTK-----IANVG--VAILGDILSDGNLAEYYRNALENWQQP 165
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         LQG--DRVPVKVSVTEVKRHKLETGIRLDSEYGLGGKIAYDYYNLFNKGYIGSVVWDMDK 339
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         YETTLAAGISQPR-----NYRGNYWTSNVSYNRS-TTQNLEKRAFSGGI---WYVRDRA 389
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              522 SYYVGLGHTYNKISNFALEYNRNLYIOSMKFKGNGIKTNDFD-----FSFGWNYNSL 573
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            NNVLHPENGHYLDGKIGTTLGTFLSSTALIRTSARAGYFFTPENKKLGTFIIRGQAGYTV 490
                                                                                                                                                                                                                                    61 DSEIKDMVEEHLPLITQQQEEVLDKEQTGFLAEEAPDNVKTMLRSKGYFSSKVSLT---- 116
                                                                                                                                                                                                                                                                                                                                                                    166 VGSDFDQDSWENSKTSVLGAVTRKGYPLAKLGNTRAAVNPD----TATVDLNVVVDSGRP 221
                                                                                                                                                                                                                                                                                                                                                                                                                                     222 IAFGDFEITGTQRYPEQIVSGLARFQPGTPYDLDLLLDFQQALEQNGHYSGASVQADFDR 281
                                                                                                                                                                                                                                                                                                                                                                                                                                                             574 NRGYFPTKG--VKASLGGRVTIPGSDNKYYKLSADVQGFYPLDRDHLWVVSAKASAGYAN 631
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                                                                                                                                                                                                                                                               184 ESVSSSTLQEQMELQPDSWWKLWGNKFEGAQFEKDLQSIRDYYLNNGYAKAQITKTDVQL
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Patent No. 6338966
GENERAL INFORMATION:
GENERAL INFORMATION:
GENERAL INFORMATION:
GENERAL STAILEN, Steve
APPLICANT: Anderson, Shawn
APPLICANT: Anderson, Shawn
APPLICANT: Rafalski, Antoni
TITLE OF INVENTION: Genes Encoding Sulfate Assimilation Proteins
FILE REFERENCE: BB-1167-A
CURRENT PAPLICATION NUMBER: US/09/346,408B
CURRENT FILING DATE: 1999-07-01
EARLIER APPLICATION NUMBER: 60/092,833
                                                                                                                                                                                                   Indels 137;
                                                                                                                                                                 Length 797;
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                349 KSSRIRASTGVGFQWQSPIGPLVFSYAKPIKKYENDDVE-QFQFSIGGSF 797
                                                                                                                                                                6.6%; Score 209.5; DB 4;
ilarity 20.0%; Pred. No. 1.9e-10;
Conservative 103; Mismatches 280;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             532 RALLVGSLEYQLP-----FTRTLSGAVFHDM---
        TELEFAX: (416) 595-1163
INFORMATION FOR SED ID NO: 6: SEQUENCE CHARACTERISTICS:
ERNGTH: 797 amino acids
TYPE: amino acids
 (416) 595-1155
                                                                                                           MOLECULE TYPE: protein US-08-942-046-6
                                                                                                                                                                                 Best Local Similarity
Matches 130; Conserv
TELEPHONE:
                                                                                               TOPOLOGY:
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     ------EWVHVLSEGWATPLKGFMREAEFLQTLHFNSLRLDDGSVVNMSVPIVLA 139
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             195 -----KLGNTRAAVNPDTATVDLNVVVDSGRPIA-FGDFEITGTQRYP--EQIVSGLA 244
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 333 VVWDMDKYETTLAAGISQPRNYRGNYWTSNVSYNRSTTQNLEKRAFSGGIWYVRDRAGID 392
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             343 A--GANFYIVGRD-----PAGMSHPVEKRDLYDADHGKKVLSMAPGLERLNILPFRV-- 392
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           449 TLGTFLSSTALIRTSARAGYFFTPENKKLGTFIIRGQAGYTVARDNADVPSGLMFRSGGA 508
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         393 -----AAYDKTQGKMA-FFDPSRPQDFLF-ISGTKMRTLARNKESPPDGFMCPGGWK 442
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APPLICANT: Allen, Steve
APPLICANT: Falco, Carl
APPLICANT: Refalski, Antoni
TITLE OF INVENTION: Genes Encoding Sulfate Assimilation Proteins
FILE REFERENCE: BB-1167-A
CURRENT APPLICATION NUMBER: US/09/346,408B
CURRENT FILING DATE: 1999-07-01
EARLIER FILING DATE: 1999-07-01
EARLIER FILING DATE: July 14, 1998
NUMBER OF SEQ ID NOS: 12
SOFTWARE: Microsoft Office 97
SEQ ID NO 4
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  140 IDDAQKHRIGD-----NKKVALFD----SKGDPVAILNNIEI---YKHPKEERIARTWG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           142 LGDILSDGNLAEYYRNALENWQQPV----GSDFDQDSWENSKTSVLGAVTRKGYPLA--
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                245 RFQPGTPY------DLDLLL--LDFQQALEQNGHY--SGASVQADFDRLQGD
                                                                                                                                                                                                                                                                                                          Query Match 3.9%; Score 123; DB 4; Length 465; Best Local Similarity 21.6%; Pred. No. 0.0077; Matches 108; Conservative 67; Mismatches 183; Indels 142;
                                                                                                                                                                                                                                                                                                                                                                                                                                            98 NVKTMLRSKGYFSSKVS--LTEKDGAYTVHITPG------
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EARLIER FILING DATE: July 14, 1998
NUMBER OF SEQ ID NOS: 12
SOFTWARE: Microsoft Office 97
SEQ ID NO 6
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           443 VLVDYY -- DSLVLSS-NGKV 459
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US-09-346-408-4
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     --PV----KVSVTEVKRHKLETGIR--LDSEYGLGGKIAYDYYNLFNKGYIGSVVWDMDK 339
                                                                                                                                                                                                                   340 YETTLAAGISQPRNYRGNYWTSNVSYNRSTTQNLEKRAFSGGIWYVRDRAGIDARLGAEF 399
                                                                                                                                                                                                                                         390 AAYDTVAKKMAFFEPSRSQDFLF-ISGTKMRTFAKTGENPPDGFMCPGGWKVLVDYYNSL 448
                                                                                               192 VDEAITPAGNWLIGGDLEVL----QPIKYNDGLDHYRLSPQQLRDEFDKRGADAVFAFQL 247
                                                                                                                                                                                                                                                                                             400 LAEGRKIPGSDIDLGNSHATMLTASWKRQLLNNVLHPENG-HYLDGKIG-TTLGTFLSST 457
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                                                                                                                                                                                                                                                                                                                       345 YIVGRD-----PAGMGHPTE----KRDLYN----PDHGKKVLSMAPGLEKLNILPFKV
                                                             -----DLDLLLDFQQALEQN---GHY--SGASVQADFDRLQGDRV----
                                                                                                                                                                             248 RNPVHNGHALLMNDTRRRLLEMGFKNPILLLHPLGG------FTKADDVPLPVRMEQ
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APPLICANT: Hsla, Ru-ching
TITLE OF INVENTION: BACTERIOPHAGE OF CHLAMYDIA PSITTACI
NUMBER OF SEQUENCES: 23
CORRESPONDENCES: 23
ADDRESSEE: Nixon, Hargrave, Devans & Doyle LLP
STREET: Clinton Square, P.O. Box 1051
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        CITY: Roches
COMPUTER READABLE FORM:
MEDIUM TYPE: Floppy disk
COMPUTER: IBM PC compatible
OPERATING SYSTEM: PC-DOS/MS-DOS
SOFTWARE: Patentin Release #1.0, Version #1.30
CURRENT APPLICATION DATA.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       55; Mismatches 214;
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Pred. No. 0.088;
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        NAME: Timian, Susan J.
REGISTRATION NUMBER: 34,103
REFERENCE/DOCKET NUMBER: 176
TELECOMMUNICATION INFORMATION:
TELEPHONE: 716-263-1636
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         TELEFAX: 716-263-1600 INFORMATION FOR SEQ ID NO: 11:
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Similarity 23.5%;
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Best Local (
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                                                                                                                                                                                     128 SVANMSVPIVLAIDDAQKHRIADSTSVALFDAN-----NNPIAILKDIEI---YKHPEEE 179
                                                                                                                                                                                                                                                           290 ADDVPLSWRWKQHEKVLEDGVLDPETTVVSIFPSPMHYAGPTEVQ------WHAKA 339
                                                                                                                                                                                                                                                                                                                                                                                                                                                                     443
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                                                                                                                                                                                                                                                                                                             RLQGDRV-----PV----KVSVTEVKRHKLETGIR--LDSEYGLGGKIAYDYYNLFNK 327
                                                                                                                                                                                                                                                                                                                                                                                         GYIGSVVWDMDKYETTLAAGISQPRNYRGNYWTSNVSYNRSTTQNLEKRAFSGGIWYVRD 387
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    340 R--INA--GANFYIVGRD-----PAGMGHPTEKRDLYDADHGKKVLSMAPGLERLNILP 389
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             -- PRTKIANVGVAILGDILSDG 149
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                                                                           PRTKIANVGVAILGDILSDGNLAEYYRNALENWQQPV----GSDFDQDSWENSKTSVLG 184
                                           Gaps
                                                                                                                                                       AVTRKGYPLA----KLGNTRAAVNPDTATVDLNVVVDSGRPIA-FGDFEITGTQRYPEQ-
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APPLICANT: Anderson, Shawn
APPLICANT: Falco, Carl
APPLICANT: Refalsk1, Antoni
TITLE OF INVENTION: Genes Encoding Sulfate Assimilation Proteins
FILE REFERENCE: BB-1167-A
CURRENT PILING DATE: 1999-07-01
EARLIER APPLICATION NUMBER: 06/092,833
EARLIER FILING DATE: Juy 14, 1998
NUMBER OF SEQ ID NOS: 12
SOFTWARE: Microsoft Office 97
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Query Match 3.6%; Score 114; DB 4; Length 461; Best Local Similarity 22.3%; Pred. No. 0.051; Matches 109; Conservative 48; Mismatches 195; Indels 136;
                                           113;
     Length 465;
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     DB 4;
                                       177;
3.8%; Score 121.5; DB 21.7%; Pred. No. 0.011; Live 63; Mismatches 1
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US-09-346-408-8
                                       Conservative
                     Similarity
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 Query Match
Best Local S
Matches 98
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Gaps

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Mismatches
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                    ----NKIYELKNSTDNLTELKSF---
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                                                                                                                                                                                                                                                                                                                                                                                                Sequence 10, Application US/08021601
Patent No. 5591631
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                   APPLICANT: Klimpel, Kurt R.
APPLICANT: Nichols, Peter J.
APPLICANT: Arora, Naveen
APPLICANT: Singh, Yogendra
TITLE OF INVENTION: ANTHRAX TC
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      COMPUTER READABLE FORM:
MEDIUM TYPE: Floppy disk
COMPUTER: IBM PC compatible
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NAME: Spratt, Gwendolyn D.
REGISTRATION NUMBER: 36,016
REFERENCE/DOCKET NUMBER: 14
TELECOMMUNICATION INFORMATION:
                                                                                                                                                                                                                                                                                                                                                                                                                                                          Leppla, Stephen H.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  404/688-0770
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AMINO ACID
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INFORMATION FOR SEQ ID NO:
SEQUENCE CHARACTERISTICS:
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CORRESPONDENCE ADDRESS:
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APPLICANT: Leppla
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     CITY: Atlanta
STATE: Georgia
COUNTRY: USA
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                                                                                                                                                                                                                                                                                                              888 YLGGSKSYVSVNPVVQNS----STDSVSPQGNLSAYALSTDTKHLFTKSFVEHGFVIGL 442
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   321 TSNEELNSKGFDYNMLGLYING-QNWKITSLTPY-----NLLTALKTEYQSLLKI 369
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     370 TNLLQELEPSKCILDSKFLLNK----FSQFSL-----GKLQNLQP-IKMDLHT 412
                                                                                                                                                                                                                                                                                    290 -----KVSVTEVKRHKLETGIRLDSEYGLGGKIAY----DYYNLFNKGYI--GSVVWD 336
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         97 DNVKTMLRSKGYFSSKVSLTEKDGAYTVHITPG------PRTKIANVGVAILGDIL 146
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                147 S------DGNLAEYYRNALENWQQPVGSDFDQDSWENSKTSVLGAVTRKGYPLAKL 196
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     197 GNTRAAVNPDTATVDLNVVVDSGRPIAFGDFEITGTQRYPEQIVSGLARFQPGTPYDLDL 256
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LITQQQEEVLDKEQTGFLAEE---APDNVKTMLRSK--GYFSSKVSLTEKDGAYTVHITP 128
                                                                   129 GPRIKIANVGVAI---LGDILSDG-NLAEYYRNALENWQQPVGSDFDQDSWENSKTSVLG 184
                                                                                                                                                                                                                                                333 VD----LAASSSVTINSLRNAITLOOWFEKSARYGSRYVESVOGHFGVHLGDYRAQRPI 387
                                                                                                                                                                                                                                                                                                                                                           337 MD-----KYETTLAAGISQPRNYRGNYWTSNVSYNRSTTQNLEKRAFSGGIWYVRDRAGI 391
                                                                                                                                                                                                                                                                                                                                                                                              443 LSATADLTYQQGLERQWSRFSRY-DYYWPTFAHLGEQPVYNKEIYCQSDTVMDPSGSAVN 501
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20.9%; Pred. No. 0.39;
tive 91; Mismatches 209; Indels 176; Gaps
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                                                                                                 236 GDSGRLPVHGLAIRSYLDDSSDDQFSFGVSYVNASQKW-----FTAD---GRLTSGMG
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                                                                                                                                                                         286 SVPVGTTGNFPIDNVVYPSYFGTTVAQTGSPSSS-----STPPFVKGDFPV----Y
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                                                                                                                                        185 AV---TRKGYPL-----AKLGNTRAAVNPDTATVDLNVVVDSGRPIAFGDFEITGTQRY
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TITLE OF INVENTION: GENES WHICH PARTICIPATE IN B-GLUCAN; ASSEMBLY AND USE THEREOF
                                                                                                                                                                                                                                                                                                                                                                                                                                                        DARLG-AEFLAEGRKIPGSDIDLGNSHATMLTASW 425
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CURRENT APPLICATION DATA:
APPLICATION NUMBER: US/08/488,316
FILING DATE: 05-MAR-1990
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             ;Patent No. 5194600
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          LENGTH: 1365
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APPLICATION NUMBER: US/08/021,601
FILING DATE: 19930212 3.5%; Score 112.5; DB 1; 20.5%; Pred. No. 0.083;

us-09-857-669-2.rai

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TELECOMMUNICATION INFORMATION:
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CITY: San Francisco
                                                                                                            TYPE: amino acid
TOPOLOGY: linear
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--HPLP 431
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                                                                                             147 VYYEIGKILS------RDILSKI-----NQPYQKFLDVLNTIKNASDSDGQ-- 186
                                                                                                                                                                                                                                                                                           332 SVVWDMDKYETTLAAGISQPRNYRGNYWTSNVSYNRSTTQNLEK------RAFS 379
                                                                                                                                                                                                                                                                                                                             222 -AYYIEPQHRDVLQLYAPEAFNYMDKFNEQEINLTRAANADVVSLTCPVAAGECAGPADS 280
                                                                                                                                                                                                                                                                                                                                                                                                      281 G------DALLERNYPTGAEFLGDGGDV-----SFSTRGTQNWTVERLLQA 320
                                                                                                                                                                                                                                                                                                                                                                                                                                          432 NVLHPENGHYLDGKIGTTLGTFLSSTALIRTSARACYFFTPENKKLGT----FIIRGQ-- 485
                                  69 DVLEMYKAIG----GKIYIV--DGDITKHISLEALSEDKKKIKD----IYG----KDALLHE 116
                                                                        154 YYRNALENWQQPVGSDFDQDSWENSKTSVLGAVTRKGYPLAKLGNTRAAVNPDTATVDLN 213
                                                                                                                                                                                                                                             321 HRQLEERGYVFVGYHGTFLE---AAQSIVFGGVRA-----RSQDLDAIWRGFYIAGDPA 371
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       427
NVKTMLRSKGYFSSKVSLTEKDGAYTVHIT----PGPRTKIANVGVAILGDILSDGNLAE 153
                                                                                                                                              214 VVVDSGRPIAFGDFEITGTQRYPEQIVSGLARFQPGTPYD--LDLLLDFQQALEQNGHYS 271
                                                                                                                                                                                                                       272 GASVQADFDRLQGDRVPVKVSVTEVKRHKLETGIRLDSEYGLGGKIAYDYYNLFNKGYIG 331
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Sequence 10, Application US/08082849B
Patent No. 5677274
GENERAL INFORMATION:
APPLICANT: Leppla, Stephen H.
APPLICANT: Alimpel, Kurt R.
APPLICANT: Alimpel, Kurt R.
APPLICANT: Alimpel, Factor Applicant: Nichols, Peter J.
TITLE OF INVENTION: Anthrax Toxin Fusion Proteins and TITLE OF INVENTION: Anthrax Toxin Fusion Proteins and NUMBER OF SEQUENCES: 35
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COMPUTER: IBM PC COMPAtible
OPERATING SYSTEM: PC-DOS/MS-DOS
SOFWARRE: Patentin Release #1.0, Version #1.30
CURRENT APPLICATION DATA:
FILING DATE: 25-JUN-1993
CLASSIFICATION: 514
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        SEE: Townsend and Townsend and Crew LLP: Two Embarcadero Center, Eighth Floor
San Francisco
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APPLICATION NUMBER: US 08/021,601
FILING DATE: 12-FEB-1993
ATTORNEY/AGENT INFORMATION:
NAME: Weber, Kenneth A.
REGISTRATION NUMBER: 31,677
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ADDRESSEE: Townsend
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                                                                                                                                                                                                                                                                                                            Length 508;
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CORRESPONDENCE ADDRESS:
ADDRESSEE: TOWNSEND and TOWNSEND KHOURIE and CREW
STREET: Steuart Street Tower, 20th Floor, One Market
STREET: Plaza
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            APPLICANT: Klimpel, Kurt R.
APPLICANT: Arora, Naveen
APPLICANT: Singh, Yogendra
APPLICANT: Nichols, Peter J.
TITLE OF INVENTION: ANTHRAX TOXIN FUSION PROTEINS AND
TITLE OF INVENTION: RELATED METHODS
                                                                                                                                                                                                                                                                                                            3.5%; Score 112.5; DB 1; 20.5%; Pred. No. 0.083; tive 78; Mismatches 189;
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GENERAL INFORMATION:
APPLICANT: Leppla, Stephen H.
TELEPAN: (415) 576-0200
TELEPAX: (415) 576-0300
INFORMATION FOR SEQ ID NO: 10:
SEQUENCE CHARACTERISTICS:
LENGTH: 508 amino acids
                                                                                                                                                                                                                                                                                                                                            Best Local Similarity 20.5%
Matches 112; Conservative
                                                                                                                                                                                                             ; MOLECULE TYPE: protein US-08-082-849B-10
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APPLICANT: Anderson. Shawn
APPLICANT: Falco, Carl
APPLICANT: Falco, Carl
APPLICANT: Rafalski, Antoni
FILE REFERENCE: BB-1167-A
CURRENT APPLICATION NUMBER: US/09/346,408B
CURRENT APPLICATION NUMBER: 00/092,833
EARLIER APPLICATION NUMBER: 60/092,833
EARLIER PILLING DATE: July 14, 1998
NUMBER OF SEQ ID NOS: 12
SOFTWARE: Microsoft Office 97
SEQ ID NO 11
                                                                                                                                                                                                                                                                                                                                                                                                                    Indels 114;
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                                                                                                                                                                                                                                                                                                                                                                                                                    68; Mismatches 202;
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22.0%; Pred. No. 0.098;
            Sequence 11, Application US/09346408B Patent No. 6338966
                                                                                                                                                                                                                                                                                                                                                                                                22.0%;
                                                                                                                                                                                                                                                                                                           TYPE: PRT; ORGANISM: Solanum tuberosum US-09-346-408-11
                                                                                                                                                                                                                                                                                                                                                                                                                    Matches 108; Conservative
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                                                GENERAL INFORMATION:
APPLICANT: Allen, Steve
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US-08-164-292B-26
JS-09-346-408-11
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                                                                                                                   SOFTWARE: Patentin Release #1.0, Version #1.25
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20.5%; Pred. No. 0.083;
tive 78; Mismatches 189;
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                                                                                                                                                                                                 ATTORNEY/AGENT INFORMATION:
NAME: Weber, Kenneth A.
REGISTATION INDMER: 31,677
REFERENCE/DOCKET NUMBER: 15280-115
TELECOMMUNICATION INFORMATION:
TELEPHONE: (415) 543-5043
INFORMATION FOR SEQ ID NO: 10:
SEQUENCE CHARACTERISTICS:
                                                                                                                                                    PCT/US94/01624
                                                                                 IBM PC compatible
SYSTEM: PC-DOS/MS-DOS
                                                                                                                                CURRENT APPLICATION DATA:
APPLICATION NUMBER: PCT/US-
FILLING DATE: June 25, 1993
CLASSIFICATION:
                                                                                                                                                                                                                                                                                                                                   Floppy disk
                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Query Match 3.5%,
Best Local Similarity 20.5%,
Matches 112; Conservative
                                                                                                                                                                                                                                                                                                                                                                                                             MOLECULE TYPE: protein
                                              COMPUTER READABLE FORM:
                                                                                                 OPERATING SYSTEM:
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PCT-US94-01624-10
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340 YETTLAAGISQPRNYRGNYWTSNVSYNRSTTQNLEKRAFSGGIWYVRDRAGIDARLGAEF 399
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                                                                                                                                                                                  PLA-KLGNTRAAVNPDTATVDLNVVVDSGRPIA-FGDFEITGTQRYPEQIVSGLARFQPG 249
                                                                                                                                                                                                                                                                                                                                                                                                                    --PV----KVSVTEVKRHKLETGIR--LDSEYGLGGKIAYDYYNLFNKGYIGSVVWDMDK 339
                                                               137 VGVAILGDILSDGNLAEYYRNALENWQQPV----GSDFDQDSWENSKTSVLGAVTRKGY 191
PONLPLSWRSKYRAGPAAARIRCGLIEPDGGKLVELIVEEPQRDLKRRQALSLPQIKLSK 85
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LOUDIK
LOUDIK
LORDS A.
RECOMBINANT PROTEIN PRODUCTION IN BOVINE
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Petent No. 5820868
GENERAL INFORMATION:
APPLICANT: MITTAL, SURESH K.
APPLICANT: GRAHAM, FRANK L.
APPLICANT: GRAHAM, LORNE A.
APPLICANT: BABIUK, LORNE A.
TITLE OF INVENTION: RECOMBINANT PROT
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RESULT 24

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477 LGTFIIRGQAGYTV-ARDN---ADVPSGLMFRSGGASSVRGYELDSIGLAGPNGSVLP-- 530
                                                                                                                                                                                                                               Sequence 26, Application US/08845623A
Fatent No. 6001591
GENERAL INFORMATION:
APPLICANT: BAIDINK, LORNE A.
APPLICANT: ARDINK, LORNE A.
APPLICANT: REDDY, POLICE S.
TITLE OF INVENTION: BOYINE ADENOVIRUS 3 GENOME;
FILE REFERENCE: 293102002120
CURRENT APPLICATION NUMBER: US/08/845,623A
CURRENT FILING DATE: 1997-04-25
EARLIER APPLICATION NUMBER: 08/164,294
EARLIER FILING DATE: 1993-12-09
NUMBER OF SEQ ID NOS: 34
SEQ ID NO 26
LENGTH: 983
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     DFEITGTQRYPEQIVSGLARFQPGT ---- PYD-LDL ---
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            ; ORCANISM: Bovine adenovirus type 3 US-08-845-623-26
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        3.5%; Score 111; DB 2; Length 983;
22.2%; Pred. No. 0.35;
Live 78; Mismatches 260; Indels 174;
FITLE OF INVENTION: ADENOVIRUS EXPRESSION VECTOR SYSTEM
                                                                                                                                                     ZIP: 94104-2675
COMPUTER READABLE FORM:
MEDIUM TYPE: Floppy disk
COMPUTER: ISH PC compatible
OPERATING STSTEM: PC-DOS/MS-DOS
SOFTWARE: PatentIn Release #1.0, Version #1.30
                                                                                                                                                                                                                                                                                                                                                                                                                   29310-20021.00
                                                                                                                                                                                                                                                               CURRENT APPLICATION DATA:
APPLICATION NUMBER: US/08/164,292B
FILING DATE: 09-DEC-1993
CLASSIFICATION: 435
ATTORNEY/AGENT INFORMATION:
NAME: GRACEY, NANCY J.
RECISTRATION NUMBER: 29310-20021.
TELEPHONE: (415) 677-7502
TELEPHONE: (415) 677-752
TELEFEX: 34-0154
INFORMATION FOR SED ID NO: 26:
SEQUENCE CHRACTERSTICS:
                NUMBER OF SEQUENCES: 34
CORRESPONDENCE ADDRESS;
ADDRESSEE: MORRISON & FOERSTER
                                                         ADDRESSEE: MORRISON & FOERSTE
STREET: 345 California Street
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        : 983 amino acids
amino acid
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Best Local Similarity 22.29
Matches 146; Conservative
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; MOLECULE TYPE: protein
US-08-164-292B-26
                                                                                                CITY: San Francisco
STATE: California
                                                                                                                                         USA
                                                                                                                                       COUNTRY:
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                                                54 -PVRIDTQD----SEIKDMVEEHLPLITQQQEEVLDKEQTGFLAEEAPDNVKTMLRSKGY 108
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Best Local Similarity 22.2%; Pred. No. 0.35;
Matches 146; Conservative 78; Mismatches 260; Indels 174;
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APPLICANT: TIKOO, SURESH K.
APPLICANT: TIKOO, SURESH K.
APPLICANT: TEDDY, POLICE S.
TITLE OF INVENTION: ISOLATION OF MUTANTS IN THE E3 REGION OF THE
TITLE OF INVENTION: BOVINE ADENOVIRUS GENOME AND THEIR USE IN VACCINES
FILE REFERENCE: 29310200121
CURRENT APPLICATION NUMBER: 08/09/103,330A
CURRENT FILING DATE: 1998-06-23
EARLIER FILING DATE: 1998-06-23
EARLIER FILING DATE: 1997-06-23
EARLIER FILING DATE: 1993-12-09
NUMBER OF SEQ ID NOS: 40
SOFTWARE: PATENTIN VET: 2.0
SOFTWARE: PATENTIN VET: 2.0
SOFTWARE: PATENTIN VET: 2.0
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-----GTVNPSAPEAPPT 583
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           226 DFEITGTORYPEQIVSGLARFQPGT-----PYD-LDL-------LLDFQQAL 264
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                                                                                                                                      531 ---ERALLVGSLEYQLPFTRTLSGAVFHD-----MGDA-AANFKRMKLKHGSGLGVR 578
                                                                                                                                                                               3 IKPTALL----LPALFFFPHAYAPAADLSENKAAGFALFKNKSPDTESVKLKPKF----
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22.2%; Pred. No. 0.35;
Live 78; Mismatches 260; Indels 174;
    533 LTDTVIRPNLGDGLEVRDNKIIVKLGANLRFENGAVTA---
                                                                                                                                                                                                                                                                                                                                                                                                                                         Sequence 26, Application US/09103330A Patent No. 6319716 GENERAL INFORMATION:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          ; TYPE: PRT
; ORGANISM: Bovine adenovirus type 3
US-09-103-330-26
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US-09-103-330-26
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Sequence 26, Application US/08015927

GENERAL INFORMATION:

APPLICANT: MITTAL, SURESH K.

APPLICANT: GRAHAM, FRANK L.

APPLICANT: REALICANT RECOMBINANT PROTEIN PRODUCTION IN BOVINE ADENOVIRUS EXPRESSION

TITLE OF INVENTION: VECTOR SYSTEM

TITLE OF INVENTION: VANDER: US/08/815,927

CURRENT APPLICATION NUMBER: US/08/815,927

CURRENT APPLICATION NUMBER: 08/164,294

EARLIER APPLICATION DATE: 1993-12-09

NUMBER OF SEQ ID NOS: 34

SEQ ID NO 26

SEQ ID NO 26

LENGTH: 983
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         54 -PVRIDTQD----SEIKDMVEEHLPLITQQQEEVLDKEQTGFLAEEAPDNVKTMLRSKGY 108
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             DFDQDSWENSKTSVLG---AVTRKGYPLAKLGNTRAAVNPDTATVDLNVVVDSGRPIAFG 225
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          ::| | | : : | | | : : | | 373 RVANGQVQIFSGRGTAIGT-----DSSLTLNIRAPLQFSGPALTASLQGSGPITYNS 424
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   NNGTFGLSIGPGMWVDQNRLQVNPGAGLVFQGNNLVPNLADPLAISDSKISLGFGLTQ 484
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Gaps
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                                                                                                                                                                               531 ---ERALLVGSLEYQLPFTRTLSGAVFHD-----MGDA-AANFKRMKLKHGSGLGVR 578
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3.5%; Score 111; DB 3; L
Best Local Similarity 22.2%; Pred. No. 0.35;
Matches 146; Conservative 78; Mismatches 260;
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       ; TYPE: PRT
; ORGANISM: Bovine adenovirus type 3
US-08-815-927-26
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US-08-815-927-26
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; ORGANISM: Haemophilus influenzae US-09-206-942-67
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Best Local Similarity 20.2%
Matches 129; Conservative
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JAPPLICANT: GRAPTICAN: MAMMALIAN CELL LINES EXPRESSING BOVINE ADENOVIRUS FUNCTIONS

FILE REFERENCE: 293102003120

CURRENT PILING DATE: 1999-11-05

EARLIER APPLICATION NUMBER: 08/164,294

EARLIER PILING DATE: 1993-12-09

NUMBER: OF SEQ ID NOS: 34

SOFTWARE: PATENTY PATENTY OF THE SEQ ID NOS: 34

SEQ ID NO 26

LENGTH: 983
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      54 -PVRIDTQD----SEIKDMVEEHLPLITQQQEEVLDKEQTGFLAEEAPDNVKTMLRSKGY 108
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       169 DFDQDSWENSKTSVLG---AVTRKGYPLAKLGNTRAAVNPDTATVDLNVVVDSGRPIAFG 225
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LGTFIIRGQAGYTV-ARDN---ADVPSGLMFRSGGASSVRGYELDSIGLAGPNGSVLP-- 530
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    129 NALQVHTGDGLTVTDDKVSLNTQAPLSTTSAGLSLLLGPSLHLGEEERLTVNT----- 181
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                       73 INPAGLLETNDLASAVFPPLASDEAGNVTLNMSDGLYTKDNKL----AVKVGPGLSLDSN 128
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                                                                       ---ERALLVGSLEYQLPFTRTLSGAVFHD-----MGDA-AANFKRMKLKHGSGLGVR 578
                                                                                                 LTAEPPLRASNSHLQLSLS---EGLVVHNNALALQLGDGMEVNQHGLTLRVGSGLQMR 638
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22.2%; Pred. No. 0.35;
tive 78; Mismatches 260; Indels 174;
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                                                                                                                                                                                                            Sequence 26, Application US/09435242
Patent No. 6379944
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Matches 146; Conservative
                                                                                                                                                                                                                              Patent No. 6379944
GENERAL INFORMATION:
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                                                                                                                                        533 LTDTVIRPNLGDGLEVRDNKIIVKLGANLRFENGAVTA-----GTVNPSAPEAPPT 583
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APPLICANT: LOOSMOCE, Sheena M.
APPLICANT: LOOSMOCE, Sheena M.
APPLICANT: Klein, Michel H.
TITLE OF INVENTION: Protective Recombinant Haemophilus Influenzae High
TITLE OF INVENTION: Molecular Weight Proteins
FILE REFERENCE: 1038-861 MIS:jb
CURRENT APPLICATION NUMBER: US/09/206,942
CURRENT FILING DATE: 1998-12-08
EARLIER FILING DATE: 1998-10-07
NUMBER OF SEQ ID NOS: 95
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                                                                                                                                                                                                                                                                                         ---ERALLVGSLEYQLPFTRTLSGAVFHD-----MGDA-AANFKRMKLKHGSGLGVR 578
                                                                                                                                                                                                                                                                                                                                                                    171 DQDS-----WENSKTSVLGAVTRKGYPLAKLGNTRAAVNPDTATVD----LNVVVDSGRP
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SSGKDQQAKYGGAFLEELQAKYPEL-----FARKQISTGVPMDPSVKIKQWS 1044
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     PSTDGKSVHQNAALDSRVMFEGFSNFQAFATKKEEYTNVVIAKNVDKFAEMGVTDFEMAP 897
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        --VSYNRSTTONLEKRAF--SGGIWYVRDR----AGIDARLGAE--FLAEGRKIPGSDI 411
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                                                                            -----SVCSERIGYYTKNEEYNLLHTITL----VDDFGSIHALKRLKNLLHTSFVGVR 697
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               318 A--YDYYNLFNKGYIGSVVWDM--DKYETTLAAGISQPRN-YRGNYWTSN-----
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                                    521 LAGPNGSVLPER-ALLVGSLEYQLPFTRTLSGAVFHDMGDAAANFKRMKLKHGSGLGVR
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APPLICANT: Nichols, Scott E.

TITLE OF INVENTION: Bubstitutes for Modified Starches and
TITLE OF INVENTION: Latexes in Paper Manufacture
FILE REFERENCE: 0357CR
CURRENT APPLICATION NUMBER: US/09/210,361
CURRENT FILING DATE: 1998-12-11
EARLIER FILING DATE: 1998-01-16
EARLIER FILING DATE: 1998-01-16
EARLIER FILING DATE: 1998-01-20
EARLIER FILING DATE: 1998-01-16
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19.7%; Pred. No. 1;
tive 87; Mismatches
                                                                                                                                                                                                                                                              Sequence 4, Application US/09210361
Patent No. 6284479
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134; Conserva
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LENGTH: 1375
                                                                                                                                                                                                  RESULT 32
US-09-210-361-4
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                                                                                                                                                                                                                                                                                                                                                                                                                                            APPLICANT: Tessier, Daniel C.
APPLICANT: Tessier, Daniel
APPLICANT: Dignard, Daniel
APPLICANT: Bergeron, John J.M.
APPLICANT: Thomas, David Y.
TITLE OF INVENTION: Wethod for screening for
TITLE OF INVENTION: UDF-glucose:glycoprotein glucosyltransferase (UGGT) activity
FILE REPERENCE: 2139-9"US"
CURRENT APPLICATION NUMBER: US/09/376,330
CURRENT FILING DATE: 1999-08-18
SOFTWARE: FASTED for Windows Version 3.0
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              33;
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       324 EELNSKGFDYNMLGLYING-QNWKITSLTPY-----NLLTALKTEYQSLLKITNL 372
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               100 KTMLRSKGYFSSKVSLTEKDGAYTVHITPG------PRTKIANVGVAILGDILS-- 147
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     -----DGNLAEYYRNALENWQQPVGSDFDQDSWENSKTSVLGAVTRKGYPLAKLGNT 199
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     LETGIRLDSEY--GLGGKIAYDYYNLFNKGY---IGSVVWDMDKYETTLAAGISQPRNYR 355
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   ---RTLSGAVFHDMG----DAAANFKRMKLKHGSG 574
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               RELDLRVTSLISEFYQYKKDITATLNFTKSIVNNFPLISKQLIKVSSVN----KDIITSN 323
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                                    575 LGVRWFSPLAPFSFDIAYGHSDKKIRWHISL---GTRF 609
                                                                                                                                                                   ; OTHER INFORMATION: S. cerevisiae KRE5
US-09-376-330-18
                                                                                                                                                                                                                                                                                                                                                     Sequence 18, Application US/09376330
Patent No. 6399321
GENERAL INFORMATION:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            TYPE: PRT ORGANISM: Artificial Sequence
532 RALLVGS--LEYQLPFT-
                                                                                                                                                                                                                                                                                                                   US-09-376-330-18
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LENGTH: 1365
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412 DLGNSHATMLTASWKRQLLNNVLHPENGHYLDGKIGTTLGTFLSSTALIRTSARAGYFFT 471
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19.7%; Pred. No. 1;
tive 87; Mismatches
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CURRENT APPLICATION NUMBER: US/09/740,274
CURRENT FILING DATE: 2000-12-19
PRIOR APPLICATION NUMBER: 09/210,361
PRIOR FILING DATE: 1998-12-11
PRIOR FILING DATE: 1998-01-16
PRIOR FILING DATE: 1998-06-07
PRIOR FILING DATE: 1998-06-07
PRIOR FILING DATE: 1998-06-07
PRIOR FILING DATE: 1998-01-20
PRIOR FILING DATE: 1998-01-20
PRIOR FILING DATE: 1998-01-16
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SOFTWARE: FastSEQ for Windows Version 3.0
SEQ ID NO 4
LENGTH: 1375
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: Sequence 4, Application US/09740274
: Patent No. 6465203
: GENERAL INFORMATION:
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US-09-740-274-4
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US-09-118-319-6
US-09-118-319-6
US-09-118-319-6
Sequence 6, Application US/09118319
Patent No. 6114158
GENERAL INFORMATION:
APPLICANT: Li, Xin-Liang
APPLICANT: Ljungdahl, Lars G.
APPLICA
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                                                                                                      ---FARKQISTGVPMDPSVKIKQWS 1044
                                                                                                                                                                                                                                                                                  1270 NGQRLYFKPNG--VQAKGEFIRDANGYLRYYDPNSGNEVRNFKVRNSKGEWFLFDHNGIA 1327
261 OQALEQNGHYSGA---SVQADFDRLQGDRVPVKVSVTEVKRHKLETGIRLDSEYGLGGKI 317
                                                                                                                                                                                                                                                                                                                                                                                                                                363 --VSYNRSTTQNLEKRAF--SGGIWYVRDR----AGIDARLGAE--FLAEGRKIPGSDI 411
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         DLGNSHATMLTASWKRQLLNNVLHPENGHYLDGKIGTTLGTFLSSTALIRTSARAGYFFT 471
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                                                                                                                                                                                                                   318 A--YDYYNLFNKGYIGSVVWDM--DKYETTLAAGISOPRN-YRGNYWTSN-----
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US-09-118-319-6
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       452 TFLSSTALIRTSARAGYFFTPENKKLGTFIIRG-QAGYTVARDNADVPSGLMFRSGGASS 510
                    TFLSSTALIRTSARAGYFFTPENKKLGTFIIRG-QAGYTVARDNADVPSGLMFRSGGASS 510
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                                                                                    ch 3.4%; Score 108; DB 4; Length 459; 1 Similarity 20.5%; Pred. No. 0.18; 90; Conservative 63; Mismatches 193; Indels
                                                                                                                                                                                                                                                                                         APPLICANT: Liungdahl, Lars G.
APPLICANT: Liungdahl, Lars G.
APPLICANT: Chen, Hulzhong
TITLE OF INVENTION: Cellulases and Coding Sequences
FILE REFERENCE: 42-96
CURRENT APPLICATION NUMBER: US/09/286,691
CURRENT FILING DATE: 1999-04-05;
EARLIER APPLICATION NUMBER: US 60/027,883
EARLIER APPLICATION NUMBER: PCT US97/18008
EARLIER FILING DATE: 1997-10-03
NUMBER OF SEQ ID NOS: 29
SOFTWARE: Patentin Ver. 2.0
SSOFTWARE: ARCOLUMENT OF THE CONTROLUMENT OF SEQ ID NOS: 29
SSO ID NO 2
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    141 ILGDILSDGNLAEYYRNALENWQQPVGSD----
                                                                                                                                                                                                                                              Sequence 2, Application US/09286691
Patent No. 6190189
                                                                                                                               511 VRGYELDSIGLAGPNGSVLP 530
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US-09-286-691-2
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Best Local $
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                                                                                 APPLICANT: Lingdahl, Lars G.
APPLICANT: Ljungdahl, Lars G.
APPLICANT: Chen, Willows
TITLE OF INVENTION: Cellulases and Coding Sequences
FILE REPERENCE: 42-96a
CURRENT APPLICATION NUMBER: US/09/687,147
CURRENT FILING DATE: 2000-10-12
PRIOR APPLICATION NUMBER: DC 60/027,883
PRIOR PILING DATE: 1996-10-04
PRIOR FILING DATE: 1997-10-03
PRIOR FILING DATE: 1997-10-03
PRIOR FILING DATE: 1997-04-05
NUMBER OF SEQ ID NOS: 29
SOFTWARE: Patentin Ver: 2.0
SEQ ID NO
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Patent No. 609576
GENERAL INFORMATION:
APPLICANT: Myers, Lisa E
APPLICANT: Schryvers, Anthony B
APPLICANT: Harkness, Robin E
APPLICANT: LOOSMOTE, Sheena M.
; Sequence 2, Application US/09687147
; Patent No. 6268198
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; ORGANISM: Orpinomyces sp.
US-09-687-147-2
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APPLICANT: Schryvers, Anthony B
APPLICANT: Schryvers, Robin E
APPLICANT: Loosmore, Sheena M.
APPLICANT: Du, Run-Pan
APPLICANT: Yang, Yan-Ping
APPLICANT: Klein, Michel H
TITLE OF INVENTION: Transferrin Receptor Genes of I
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           MEDIUM TYPE: Floppy disk
COMPUTER: IBM PC compatible
OPERATING SYSTEM: PC-DOS/MS-DOS
SOFTWARE: Patentin Release #1.0, Version #1.30
CURRENT APPLICATION DATA:
APPLICATION NUMBER: US/08/778,570B
FILING DATE: 03-JAN-1997
ATHORDMEY APPLICATION: 536
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STREET: 6th Floor, 330 University Avenue
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          CLASSIFICATION: 536
ATTORNEY/AGENT INFORMATION:
NAME: Stewart, Michael I
REGISTRATION NUMBER: 24973
REFERENCE/DOCKET NUMBER: 1038-664
TELECOMMUNICATION INFORMATION:
                                                                                                                                                                                            RESULT 38
US-08-778-570B-12
'Sequence 12, Application US/08778570B
'Patent No. 6437096
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           TELEPHONE: (416) 595-1155
TELEFAX: (416) 595-1163
INFORMATION FOR SEQ ID NO: 12:
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TYPE: amino acid
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APPLICANT: Myers, Lisa E
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ZIP: M5G 1R7
COMPUTER READABLE FORM:
MEDIUM TYPE: Floppy of
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TOPOLOGY: linear
US-08-778-570B-12
                                                                         550 SGAVFHDMGDAAAN 563
                                                                                                                       475 KNEFTKDKPESATN 488
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STATE: O
COUNTRY:
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APPLICANT: Du, Run-Pan
APPLICANT: Yang, Yan-Ping
APPLICANT: Klein, Michel H
TITLE OF INVENTION: Transferrin Receptor Genes of Moraxella
NUMBER OF SEQUENCE: 31
CORRESPONDENCE ADDRESS:
                                                                                                                                                              STREET: 6th Floor, 330 University Avenue
CITY: Toronto
STATE: Ontario
COUNTRY: Canada
ZIP: M5G 1R7
COMPUTER READABLE FORM:
MEDIUM TYPE: Floppy disk
COMPUTER: 1BM PC compatible
OPERATING SYSTEM: PC-DOS/MS-DOS
SOSTWARE: Patentin Release #1.0, Version #1.30
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         3.4%; Score 107.5; DB 3; 20.2%; Pred. No. 0.4; tive 69; Mismatches 202;
                                                                                                                                           E: Sim & McBurney
6th Floor, 330 University Avenue
                                                                                                                                                                                                                                                                                                                                                                                                    CURRENT APPLICATION DATA:
APPLICATION NUMBER: US/08/613,009A
FILING DATE: 08-MAR-1996
CLASSIFICATION: 435
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  NAME: Stewart, Michael I
REGISTRATION NUMBER: 24973
REFERENCE/DOCKET NUMBER: 1038
TELECOMMUNICATION INFORMATION:
TELEPHONE: (416) 595-1165
TELEFAX: (416) 595-1163
INFORMATION FOR SEQ ID NO: 10: SEQUENCE CHARACTERISTICS:
LENGTH: 682 amino acids
TYPE: amino acids
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US-08-613-009A-10
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Matches 112; Conserve
                                                                                                                                             ADDRESSEE:
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                                                                                                                                                                       93 EEAPDNVKTMLRSKGYFSSKVSLTEKDGAYTVHITPGPRTKIANVGVAILGDILSDGNLA 152
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                                            Gaps
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                                              Indels 171;
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APPLICANT: LOSSINGE, Sheena M
APPLICANT: Du, Run-Pan
APPLICANT: Wang, Quijun
APPLICANT: Yang, Yan-Ping
APPLICANT: Klein, Michel H
TITLE OF INVENTION: LACTOFERRIN RECEPTOR GENES OF MORAXELLA
NUMBER OF SEQUENCES: 67
CORRESPONDENCE ADDRESS:
ADDRESSEE: SIm & McBurney
STREET: Gith Floor, 330 University Avenue
    Length 682;
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ZIP: M5G 1R7
COMPUTER READABLE FORM:
MEDLUM TYPE: F10Ppy disk
COMPUTER: IBM PC compatible
OPERATING SYSTEM: PC-DOS/NS-DOS
SOFTWARE: Patentin Release #1.0, Version #1.30
CURRENT APPLICATION DATA:
APPLICATION NUMBER: US/08/867,941
FILING DATE: 03-JUN-1997
3.4%; Score 107.5; DB 4;
20.2%; Pred. No. 0.4;
tive 69; Mismatches 202;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    US-08-867-941-25
; Sequence 25, Application US/08867941
Patent No. 5977337
; GENERAL INFORMATION:
  Query Match 3.4%
Best Local Similarity 20.2%
Matches 112; Conservative
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                                                                                                                                                                                                                                                                                                                                                                  Indels 171;
                                                                                                                                                                                                                                                                                                                           Length 702;
                                                                                                                                                                                                                                                                                                                       Query Match 3.4%; Score 107.5; DB 2; Best Local Similarity 20.2%; Pred. No. 0.42; Matches 112; Conservative 69; Mismatches 202;
CLASSIFICATION: 435
ATTORNEY/AGENT INFORMATION:
NAME: Stewart, MICHAELI
REGISTRATION NUMBER: 24,973
REFERENCE/DOCKET NUMBER: 1038-681 MIS:jb
TELECOMMUNICATION INFORMATION:
TELECOMMUNICATION INFORMATION:
TELEPAN: (416) 595-1155
TELEFAX: (416) 595-1163
INFORMATION FOR SEQ ID NO: 25:
SEQUENCE CHARACTERISTICS:
LENGTH: 702 amino acids
TYPE: amino acid
STRANDEDNESS: single
STRANDEDNESS: single
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             KNEFTKDKPESATN 508
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Search completed: November 9, 2002, 01:21:40 Job time: 30 secs

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GenCore version 5.1.3
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OM protein - protein search, using sw model

November Run on:

9, 2002, 01:17:09 ; Search time 21 Seconds (without alignments) 2787.898 Million cell updates/sec

US-09-857-669-2 3173 1 MMIKPTALLLPALFFFPHAY.....IAYGHSDKKIRWHISLGTRF 609 Title: Perfect score: Sequence:

BLOSUM62 Gapop 10.0 , Gapext 0.5 Scoring table:

283224 seqs, 96134422 residues Searched:

Total number of hits satisfying chosen parameters:

Minimum DB seq length: 0 Maximum DB seq length: 200000000

Post-processing: Minimum Match 0% Maximum Match 100% Listing first 45 summaries

Database :

PIR_73:*
1: pir1:*
2: pir2:*
3: pir3:*
4: pir4:*

Pred. No. is the number of results predicted by chance to have a score greater than or equal to the score of the result being printed, and is derived by analysis of the total score distribution.

	Description	probable outer mem	hvpo		hypothetical 64.8K				0	probable exported	conserved hypothet	hypothetical prote			outer membrane pro	hypothetical prote	conserved hypothet	outer membrane pro	outer membrane pro	outer membrane pro	probable surface a	surface antiqen VC	outer membrane pro	hypothetical prote			- O	hypothetical prote		
SUMMARIES	QI	A82025	G81003	F83327	S56445	F91278	F86119	B64012	AE0428	AD1055	F82064	Н97672	AF2897	G82706	AI3488	AF2089	B87448	D82000	G81228	C70412	AC0129	B82099	AB0530	A64742	C90651	C85502	н83190	AE2417	F87486	JC4078
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	Length	615	635	579	577	577	577	578	578	577	582	641	617	617	623	833	628	797	797	778	795	803	803	810	810	810	797	9/9	769	797
æ	Query	99.4	98.8	14.2			12.0	11.8	11.6				10.1	9.7		8.8		8 .0			•									
	Score	3153	3136	449	379.5	379.5	379.5	374	368.5	355.5	348	323.5	320	306.5	290.5	279	272.5	253	253	246	246	227	226	217	217	217	215.5	211		209.5
	Result No.	-	7	e	4	S	φ,	7	89	6	10	11	12	13		15	16	17	18	19	20	21	22	23	24	25	56	27	28	29

protective surface	outer membrane pro	hypothetical prote	outer membrane pro	outer membrane ant	outer membrane pro	ompl protein precu	group 1 outer memb	hypothetical prote	probable outer mem	Omp85 analog [impo	omp85 analog - Chl	protective surface	probable omp85 ana	Outer membrane pro	outer membrane pro
02	30	60	593	731	355	527	746	816	910	528	094	601	371539	726	397725
F6410	A81430	877409	H816	E82	AH3	D97	AE2	AC1	F71	D86	D72	G64601	B71	D71726	B97
2 F641	2 A814	2 S774	2 H816	2 E82	2 AH3	2 D97	2 AE2	2 AC1	2 F71	2 D86	2 D72	2 G64	2 B71	2 D71	2 B97
7	ď	~	~	784 2 E82	7	~	7	~	N	7	~	N	2	7	2
808 2 1	739 2	861 2	792 2	~	781 2	774 2	774 2	491 2	906 2	790 2	790 2	916 2	792 2 E	768 2 1	768 2
6.6 808 2 8	6.5 739 2	6.4 861 2	6.3 792 2	784 2	6.1 781 2	5.8 774 2	5.8 774 2	5.6 491 2	5.5 906 2	5.5 790 2	5.5 790 2	5.4 916 2	5.3 792 2 E	5.1 768 2 1	5.1 768 2 8

## ALIGNMENTS

	RESULT 1 A82025 probable C; Species C; Date: C C; Accessi R; Parkhill	RESULT 1 A82025 probable outer membrane protein NMA0296 [imported] - Neisseria meningitidis (strain C;Species: Neisseria meningitidis C;Species: Neisseria meningitidis C;Date: 05-May-2000 #sequence_revision 05-May-2000 #text_change 02-Feb-2001 C;Accession: A82025 R;Parkhill, J; Achtman, M; James, K.D.; Bentley, S.D.; Churcher, C; Klee, S.R.; I	s (strain / 1 e, S.R.; M
· •	Nature 4( A; Title: A; Referen A; Accessi A; Status:	outoyo, 30: orgets, N.; beaumel, 3:; moute, 3:; mungall, N.; Quall, M.A.; kajano. Mature 404, 50: 506, 2000 A;Title: Complete DNA sequence of a serogroup A strain of Neisseria menigitidis 224; A;Reference number: A81775; MUID:2022556; PMID:10761919 A;Accession: A82025 A;Status: preliminary	tidis 2249
	A, Residues: 1-6 A, Cross-referen A, Experimental C, Genetics: A, Gene: NMA0296	A.Residues: 1-615 - CAR> A.Cross-references: GB.AL162752; GB.AL157959; NID:97378778; PIDN:CABB3602.1; A.Experimental source: serogroup A. strain 22491 G.Gonetics: A.Gene: NMA0296	1; PID:973
	Query Match Best Local Matches 60	Ouery Match 99.4%; Score 3153; DB 2; Length 615; Best Local Similarity 99.3%; Pred. No. 8.1e-204; Matches 605; Conservative 1; Mismatches 3; Indels 0; Gaps	0;
	Oy 1 Db 7	MMIKPTALLLPALFFFPHAVAPAADLSENKAAGFALFKNKSPDTESVKLKPKFPVRIDTO 60 	
	Oy 61 Db 67	DSEIKDMVEBHLPLITQQQEEVLDKEQTGFLAEBAPDNVKTMLRSKGYFSSKVSLTEKDG 120 	
	Qy 121 Db 127	AYTVHITEGPRTKIANVGVAILGDILSDGNLAEYYRNALENWQQPVGSDFDQDSWENSKT 180 	
	Qy 181 Db 187	SVIGAVTRKGYPLAKLGNTRAAVNPDTATVDLNVVVDSGRPIAFGDFEITGTQBYPEQIV 240 	
	Oy 241 Db 247	SGLARFQPGTPYDLDLLLDFQQALEQNGHYSGASVQADFDRLQGDRVPVKVSVTEVRHK 300 	
	Qy 301 Db 307	LETGIRLDSEYGLGGKIAVDYYNLFNKGYIGSVVWDMDKYETTLAAGISOPRNYKGNYWT 360 	
	Oy 361 Db 367	SNVSYNRSTTQNLEKRAFSGGIWYVRDRAGIDARLGAEFLAEGRKIPGSDIDLGNSHATM 420 	

2

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Conserved hypothetical protein PA2543 [imported] - Pseudomonas aeruginosa (strain PAO Cispecies: Pseudomonas aeruginosa Basersion: F83327 Ristover, C.K.; Pham, X.Q.; Erwin, A.L.; Mizoguchi, S.D.; Warrener, P.; Hickey, M.J.; adman, S.; Yuan, Y.; Brody, L.L.; Coulter, S.N.; Folger, K.R.; Kas, A.; Larbig, K.; L.; Lory, S.; Olson, M.W.
Nature 406, 959-964, 2000 A;Tiller Complete genome sequence of Pseudomonas aeruginosa PA01, an opportunistic pa A;Reference number: A82950; MUID:20437337; PMID:10984043 A;Reference number: A82950; MUID:20437337; PMID:10984043 A;Residues: L-579 csro> A;Cross-references: GB:AE004682; GB:AE004091; NID:g9948598; PIDN:AAG05931.1; GSPDB:GN A;Experimental source: strain PA01
C;Genetics: Pa2543
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                126 ITPGPRTKIANVGVAILGDILSDGNLAEYYRNALENWQQP-----VGSDFDQDSWENSK 179
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                                                                                                                                                        | :: :: :| | : | | : | | | EAYUGSLGERDEAALQR----FRRNAEAQAEKAAQALGYFQAQIDSEVKDGKPPKLTLK
      LTASWKRQLLNNVLHPENGHYLDGKIGTTLGTFLSSTALIRTSARACYFFTPENKKLGTF
                                                                    LLPALFFFPHAYAPAADLSENKAAGFALFKNKSPDTESVKLKPKFPVRIDTQDSEIKDMV
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                                              IIRGQAGYTVARDNADVPSGLMFRSGGASSVRGYELDSIGLAGPNGSVLPERALLVGSLE
                                                                                                                                  YQLPFTRTLSGAVFHDMGDAAANFKRMKLKHGSGLGVRWFSPLAPFSFDIAYGHSDKKIR
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Cipate: 31-War-2000 #sequence_revision 31-Mar-2000 #text_change 19-Jan-2001
Cipate: 31-War-2000 #sequence_revision 31-Mar-2000 #text_change 19-Jan-2001
R.Tettelin, H.; Saunders, N.J.; Heidelberg, J.; Jeffries, A.C.; Nelson, K.E.; Eisen, J.A.H.CKey, E.K.; Haft, D.H.; Salzberg, S.L.; White, O.; Fleischmann, R.D.; Dougherty, B.A.; It, H.; Oln, H.; Vamathevan, J.; Gill, J.; Scarlato, V.; Masignani, V.; Pizza, M.
Science 287, 1809-1815, 2000
A.Title: Complete genome sequence of Nelsseria meningitidis serogroup B strain MCSB.
A.Accession: G81003
A.Ac
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                                                                                                                                                                                                                                                                                                                                                                                                      conserved hypothetical protein NMB2134 [imported] - Neisseria meningitidis (strain
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Pred. No. 1.2e-202;
3; Mismatches 5;
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Best Local Similarity 98.7%;
Matches 601; Conservative
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:  :   ::	Db 350 VASRYWDLSSGWQRAIN	
QY 520 GLAGPNGSVLPERALLVGSLEYQLPFTRTLSGAVFHDMGDAAANFKRMKLKHGSGLGVRW 579  1 :   :   :	QY 470 DY 470 DSQRYSIDYSNTAWGSDVDF	470FITRGAGYTVARDNADVPSGL 501 1
OY 580 FSPLAPFSFDIAVG-HSDKKIRMHISLG 606  11:	Oy 502 MFRSGGASSVRGYELDSIGLA   :   :   !  Db 467 RFFAGGDRSIRGYKYKSIAPP	502 MFRSGGASSVRGYELDSIGLAGPNGSVLPERALVGSLEYQLPFTRTLSGAVFHDMGDAA 561 
RESULT 4 S56445 Hypothetical 64.8K protein (msra-chpbi intergenic region) - Escherichia coli (strain K-1 N'Alternate names: hypothetical protein o577	QY 562 ANFKRMKLKHGSGLGVRWFSI :::                  Db 527 SDIRRSDFKTGTGVGVRWESI	ANFKRMKLKHGSGLGVRWFSPLAPFSFDIAYGHSDKKIRWHISLG 606 :::     :
C; Species: Escherichia coli C; Date: 28-Oct-1995 #sequence_revision 03-Nov-1995 #text_change 01-Mar-2002 C; Accession: S56445; G65233 R; Burland, V.; Plunkett III, G.; Sofia, H.J.; Daniels, D.L.; Blattner, F.R. Nucleic Acids Res. 23, 2105-2119, 1995 A;Title: Analysis of the Escherichia coli genome VI: DNA sequence of the region from 92	RESULT 5 F91278 hypothetical protein ECs5198 [: C.Species: Escherichia coli C.Jaces: 18-Jul-2001 #sequence_1	RESULT 5 F91278 hypothetical protein ECs5198 [imported] - Escherichia coli (strain O157:H7, substrain C:Species: Escherichia coli C:Species: 18-Jul-2001 #sequence_revision 18-Jul-2001 #text_change 18-Jul-2001
A;Reference number: S56314; MUID:95334362; PMID:7610040 A;Accession: S56445 A;Accession: S56445 A;Status: preliminary; nucleic acid sequence not shown; translation not shown	R; Hayashi, T.; Makino, K.; Ohn gasawara, N.; Yasunaga, T.; Kul DNA Res. 8, 11-22, 2001	ishi, M.; Kurokawa, K.; Ishii, K.; Yokoyama, K.; Han, nara, S.; Shiba, T.; Hattori, M.; Shinagawa, H.
A:Residues: 1-577 <bur> A:Residues: 1-577 <bur> A:Cross-references: EMBL:U14003; NID:g1263172; PIDN:AAA97116.1; PID:g537061 A:Note: the nucleotide sequence was submitted to the EMBL Data Library, August 1994 R:Blattner, F.R.; Plunkett III, G.; Bloch, C.A.; Perna, N.T.; Burland, V.; Riley, M.; Cc</bur></bur>	A.Title: Complete genome sequer A.Reference number: A99629; MU A.Accession: F91278 A.Status: preliminary A.Molecule type: DNA	A;Title: Complete genome sequence of enterohemorrhagic Escherichia coli 0157:H7 and A;Reference number: A99629; MUID:21156231; PMID:11258796 A;Accession: F91278 A;Status: preliminary A;Molecule type: DNA
Science 277, 1453-1462, 1997 A;Title: The complete genome sequence of Escherichia coli K-12. A;Reference number: A64720; MUID:97426617; PMID:9278503 A;Accession: G65233 A;Accession: G65233	A.Residues: 1-5/7 <hay> A.Cross-references: GB:BA00000' A.Experimental source: strain (C;Genetics: A;Gene: ECS5198)</hay>	7; PIDN:BAB38621.1; PID:913364675; GSPDB:GN00154 0157:H7, substrain RIMD 0509952
A; Molecule type: DNA A: Residues: 1-577 <blat> A: Cross-references: GB. RE000493; GB: U00096; NID: 92367360; PIDN: AAC77177.1; PID: 91790666; A: Experimental course: gt. st. st. st. st. st. st. st. st. st. s</blat>	Ouery Match Best Local Similarity 24.7%; Matches 145; Conservative 87	<ul> <li>b; Score 379.5; DB 2; Length 577;</li> <li>b; Pred. No. 1.2e-17;</li> <li>B7; Mismatches 245; Indels 111; Gaps 20;</li> </ul>
C;Genetics: A;Gene: ytfM A;Start codon: GTG	Qy 74 LITQQQEBVLDKEQTGFLAEI     : :      1 STIESDEVTPDRR- 9-FRAI	74 LITQQQESVLDKEQTGFLAEEAPDNVKTMLRSKGYFSSKVSLTEKDGAYTVHIT 127       : :
Query Match 12.0%; Score 379.5; DB 2; Length 577; Best Local Similarity 24.7%; Pred. No. 1.2e-17; Matches 145; Conservative 87; Mismatches 245; Indels 111; Gaps 20;	Qy 128 PGPRTKIANVGVAILGDILS!	128 PGPRTKIANYGVAILGDILSDGNLAEYYRNALENWQQPYGSDFDQDSWENSKTSVLGAVT 187 
OY 74 LITOQOEEVLDKEGTGFLAEEAPDNVKTMLRSKGYFSSKVSLTEKDGAYTVHIT 127 1   :     :   :   :   :   :   Db 43 LSTIESDEVTPDRRFRARVDDAIREGLKALGYYQPTIEFDLRPPPKKGRQVLIAKVT 99	Qy 188 RKGYPLAKLGNTRAA'                   Db 155 RKGYFDSEFTKAQLGIA	RKGYPLAKLGNTRAAVNPDTATVDLNVVVDSGRPIAFGDFEITGTQRYPEQIVSG 242 
QY 128 PGPRTKIANVGVALLGDILSDGNLAEYYRNALENWQQPVGSDFDQDSWENSKTSVLGAVT 187	QY 243 LARFQPGTPYDLDLLLDFQQ             :     209 LVPFKEGDEYESKDLAELNR	LARFQPGTPYDLDLLDFQQALEQNGHYSGASVQADFDRLQGDRV-PVKVSVTEVKRHKL 301 
Qy 188 RKGYPLAKLGNTRAAVNPDTATVDLNVVVDSGRPIAFGDFEITGTQRYPEQIVSG 242	QY 302 ETGIRLDSEYGLGGKIAYDY: DD 269 ETGVGYSTDVGPRVKATW	ETGIRLDSEYGLGGKIAYDYYNLFNKGYIGSVYWDMDKYETTLAAGISQPRNYRGNYWTS 361    : ::
OY 243 LARFOPGTPYDLDLILDFOOALEONGHYSGASYQADFDRLOGDRY-PVKYSVTEVKRHKL 301  1   1   1   1   1   1   1   1   1   1	Oy 362 NVSYNRSTTONLEKRAFSGG: 11 :  Db 312 DFSYKMPLLKN	NVSYNRSTIONLEKRAFSGGIWYVRDRAGIDARLGAEFLAEGRKIPGSDIDLGNSHATML 421 :
OY 302 ETGIRLDSEYGLGGKIAYDYYNLFNKGYIGSVYMDMDKYETTLAAGISQPRNYRGNYWTS 361	Qy 422 TASWKRQLLNNV)	422 TASWKROLLNNVLHPENGHYLDGKIGTTLGTFLSSTALIRTSARAGYF 469 1
QY 362 NVSYNRSTTQNLEKRAFSGGIMYVRDRAGIDARLGAEFLAEGRKIPGSDIDLGNSHATML 421 1	Qy 470	470
Oy 422 TAS4WKRQLLNNVLHPENGHYLDGKIGTTLGTFLSSTALIRTSARAGYF 469	Qy 502 MFRSGGASSVRGYELDSIGL	502 MFRSGGASSVRGYELDSIGLAGPNGSVLPERALLVGSLEYQLPFTRTLSGAVFHDMGDAA 561

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Process Heamophilus influenzae (Strain Na Nazo) (Species: Heamophilus influenzae (Strain Na Nazo) (Species: Heamophilus influenzae (Species) 
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               SKTSVLGAVTRKGYPLAKLGNTRAAVNPDTATVDLNVVVDSGRPIAFGDFEITGTQRYPE 237
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Gaps
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                6 LKLTALFL-ALSCFPAFAEQTVDIEVQGIRGFRAVRNTD-------LNVNLINK
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        -- GAYTVHITPGPRTKIANVGVAILGDILSDGNLAEYYRNALENWQQPVGSDFDQDSWEN
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   238 QIVSGLARFQPGTPYDLDLLLDFQQALEQNGHYSGASVQADFDRLQGDRVPVKVSVTEVK
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             370 TONLEKRAF----SGGIMYVRDRAGIDARLGAEFLAEGRKIPGSDIDLGNSHATMLTASW
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    376 QADITDKTLLLYPTVGFTRTRLRGGSFATWG-----DVQKI---TFDLS-----
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       EEMDGSERYQHLVTKA-------VDRGLRVFGYYESSVRFERKQRQG
                                                          hypothetical protein HI0698 - Haemophilus influenzae (strain Rd KW20)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    11.8%; Score 374; DB 2; Length 578; 22.9%; Pred. No. 2.9e-17; ive 93; Mismatches 263; Indels 158;
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Best Local Similarity 22.9%
Matches 153; Conservative
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                                                                                                                                                                                                                                                                                               hypothetical protein ytfM [imported] - Escherichia coli (strain O157:H7, substrain EDL93 C; Species: Escherichia coli descherichia coli descherichia coli descherichia coli D: R: Reference R: R: R: Plunkett III, G: Burland, V.; Mau, B.; Glasner, J.D.; Rose, D.J.; Mayhen, N.T.; Plunkett III, G: Burland, V.; Mau, B.; Glasner, J.D.; Rose, D.J.; Mayhen, N. R: Grome sequence of enterohemorrhagic Escherichia coli O157:H7.

A: Reference number: A85480; MUID:21074935; PMID:11206551

A: Reference number: A85480; MUID:21074935; PMID:11206551

A: Residues: preliminary

A: Molecule Cype: DNA

A: Residues: 1-577 <STO>
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| | : :|| : :|| : :|| : :|| : :|| : :|| CSTIESDEVTPDRR---FRARVDAIREGLKALGYYQPTIEFDLRPPKKGRQVLJAKVT
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Indels
                                                                                                                       SDIRRSDFKTGTGVGVRWESPVGPIKLDFAVPVADKDEHGLQFYIGLG
                                                                                          ANFKRMKLKHGSGLGVRWFSPLAPFSFDIAYGHSDKK---IRWHISLG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             DB 2;
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llarity 24.7%; Pred. No. 1.2e-17;
Conservative 87; Mismatches 245;
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tes 145; Conserv
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C)Date: 02-Nov-2001 Sequence_revision 02-Nov-2001 #text_change 02-Nov-2001
C)Accession: AEG428
R;Parkhill, J; Wren, B.W.; Thomson, N.R.; Titball, R.W.; Holden, M.T.G.; Prentice, M.B. deno-Tarraga, A.M.; Chillingworth, T.; Cronin, A.; Davies, R.M.; Davis, P.; Dougan, G.; Il, M.; Rutherford, K.; Simmonds, M.; Skelton, J.; Stevens, K.; Whitehead, S.; Barrell, Asture 413, 523-527, 2001
A;Title: Genome sequence of Yersinia pestis, the causative agent of plague.
A;Reference number: AB0001; MUID:21470413; PMID:11586360
A;Status: preliminary
A;Molecule type: DNA
                                                                                                                                                                                                                                                                                                                                                                                                        21;
                                                                                                                                                                                                                                                                             A; Cross-references: GB:AL590842; PIDN:CAC92753.1; PID:g15981448; GSPDB:GN00175 C; Genetics:
A; Gene: YPO3524
  - Yersinia pestis (strain CO92)
                  C.Species: Yersinia pestis
C.Date: 02-Nov-2001 #sequence_revision 02-Nov-2001 #text_change 02-Nov-2001
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                AAGISQPRNYRGNYWTSNVSYNRSTTQNL----EKRAFSGGIWYVRDRAGIDARLGAEFL 400
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           KFPVRIDTQDSEIKDMVEEHLPLITQQQEEVLDKEQTGFLAEEAPDNVKTMLRSKGYFSS 111
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              IGSVLNHGDFDNFTSSLTGLALRRGYFDANMIKSQLGVAAQLHEAFWDIDFDSGQRYRFG 193
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                                                                                                                                                                                                                                                                                                                                                                                                                                            1 MMIKPTALLLPALFFFPHAYAP-----AADLSENKAAGFALFKNKSPDTESVKLKP 51
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       112 KVSLTEKD-----GAYTVHITPGPRTKIANVGVAILGDILSDGNLAEYYRNALENWQQP
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                                                                                                                                                                                                                                                                                                                                                                                                      Indels 161;
                                                                                                                                                                                                                                                                                                                                                                 Length 578;
                                                                                                                                                                                                                                                                                                                                                             ; Score 368.5; DB 2;
; Pred. No. 6.8e-17;
93; Mismatches 264;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             #51 GTFLSSTALIRTSARAGY-------
exported protein YPO3524 [imported]
                                                                                                                                                                                                                                                                                                                                                             11.6%;
22.8%;
                                                                                                                                                                                                                                                                                                                                                        Query Match
Best Local Similarity 22.8%;
Matches 153; Conservative
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C. Species: Salmonella enterica subsp. enterica serovar Typhi
A.Note: this species has also been called Salmonella typhi
C. Date: 09-Nov-2001 #sequence_revision 09-Nov-2001 #text_change 09-Nov-2001
C. Accession: AD1055
R.Parkhill, J.; Bougan, G.; James, K.D.; Thomson, N.R.; Pickard, D.; Wain, J.; Church R.Parkhill, T.; Connerton, P.; Cronin, A.; Davis, P.; Davies, R.M.; Dowd, L.; White, N.; Fars, S.; Moule, S.; O'Gaora, P.
Nature 413, 848-852, 2001
A.Authors: Parry, C.; Quail, M.; Rutherford, K.; Simmonds, M.; Skelton, J.; Stevens, A; Title: Complete genome sequence of a multiple drug resistant Salmonella enterica sca. A; Ratus: preliminary
A. Mccession: AD1055
A. Status: preliminary
A. Moceleule type: DMA
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A;Cross-references: GB:AL513382; PIDN:CAD06889.1; PID:916505537; GSPDB:GN00176
C;Genetics:
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Matches 134; Conservative
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conserved hypothetical protein VC2548 [imported] - Vibrio cholerae (strain N16961 sea

RESULT 9

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AF2897
conserved hypothetical protein Atu2615 [imported] - Agrobacterium tumefaciens (strain c)Species: Agrobacterium tumefaciens
C; Date: 11-Jan-2002 #sequence_revision 11-Jan-2002 #text_change 11-Jan-2002
C; Date: 11-Jan-2002 #sequence_revision 11-Jan-2002 #text_change 11-Jan-2002
C; Accession: AF2887
R; Wood, D.W.; Setubal, J.C.; Kaul, R.; Monks, D.; Chen, L.; Wood, G.E.; Chen, Y.; Woo erage, G.; Gillet, W.; Grant, C.; Guenthner, D.; Kutyavin, T.; Levy, R.; Li, M.; McCl
S; Karp, P.; Romero, P.; Zhang, S.
S; Cience 294, 2317-2323; 2001
A; Authors: Yoo, H.; Tao, Y.; Biddle, P.; Jung, M.; Krespan, W.; Perry, M.; Gordon-Kam
             A;Title: Genome Sequence of the Plant Pathogen and Biotechnology Agent Agrobacterlum A;Reference number: A97359; PMID:11743194
A;Accession: H97672
A;Status: preliminary
A;Molecule type: DNA
A;Residues: 1-641 <KUR>
A;Cross-references: GB:AE007869; PIDN:AAK88337.1; PID:g15157817; GSPDB:GN00169
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A;Title: The Genome of the Natural Genetic Engineer Agrobacterium tumefaciens C58.
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  LKSSLENSSLLLADK ---- DKPASGDLGLLIKARDDRDRLIAALYENARYGGIVNVTVA 130
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           19 TALAVALTFALYPAF--ARDAFAFKLFGMRLWGSEEPEVEVIN-PVKYAVTLDAADADKS
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                                                                                                                                                                                                                                                                                 A;Gene: AGR_C_4742
A;Map position: circular chromosome
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C;Species: Vibrio cholerae
C;Date: 18-Aug-2000 #sequence_revision 20-Aug-2000 #text_change 02-Feb-2001
C;Accession: F82064
R;Heidelberg, J.F.; Eisen, J.A.; Nelson, W.C.; Clayton, R.A.; Gwinn, M.L.; Dodson, R.J.; chardson, D.; Ermolaeva, M.D.; Vamathevan, J.; Bass, S.; Qin, H.; Dragoi, I.; Sellers, F. Nature 406, 477-483, 2000
A;Title: DNA Sequence of both chromosomes of the cholera pathogen Vibrio cholerae.
A;Reference number: A82035; MUID:20406833; PMID:10952301
A;Accession: F82064
A;Status: prellminary
A;Molecule type: DNA
A;Residues: 1-582 <HEI>A;Residues: 1-582 <HEI
A;Residues: 1-582 <H
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C;Species: 30-Sep-2001 #sequence_revision 30-Sep-2001 #text_change 11-Jan-2002
C;Accession: H97672
R;Godoner, B.; Hinkle, G.; Gattung, S.; Miller, N.; Blanchard, M.; Ourollo, B.; Goldman, A.; Liu, F.; Wollam, C.; Allinger, M.; Doughty, D.; Scott, C.; Lappas, C.; Markelz, B.; Science 294, 2333-2328, 2001
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 117 -EKDGAYTVHITPGPRTKIANVGVAILGDILSDGNLAEYYRNALENWQQPVGSDFDQDSW 175
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               SEDNORLRAAVILGEVIRLSEVDIVIRGEAEGDRDFORLIRRS----GLRVDAPLNHSLY 149
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  PEQIVSGLARFQPGTPYDLDLLLDFQQALEQNGHYSGASVQADFDRL-QGDRVPVKVSVT 294
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                KDNVEAYLSSIAAQDYSTSLRFQSQLERSMT----EA-----LNALGYYHPSIDFTV
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 11.0%; Score 34%; DB 2; Length 582;
23.1%; Pred. No. 1.6e-15;
Live 96; Mismatches 255; Indels 102;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    || | : : |::|| | ALNEYRIQYGMKHL--DKRDTESLESNLSLERHW--------
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Best Local Similarity 23.1
Matches 136; Conservative
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A; Molecule type: DNA
A; Realdues: 1-617 <SINA
A; Residues: 1-617 <SINA
A; Cross-references: GB:AEO3957; GB:AEO03849; NID:g9106207; PIDN:AAF84041.1; GSPDB:GN
A; Experimental source: strain 9a5c
R; Simpson, A.J. G.; Rednach, F.C.; Arruda, P.; Abreu, F.A.; Acencio, M.; Alvarenga, R.
Briones, M.R.S.; Bueno, M.R.P.; Camargo, A.A.; Camargo, L.E.A.; Carraro, D.M.; Carrer
as-Neto, E.; Docena, C.; El-Dorry, H.; Facincani, A.P.; Ferreira, A.J.S.
submitted to GenBank, June 2000
A; Authors: Ferreira, V.C.A.; Ferro, J.A.; Fraga, J.S.; Franca, S.C.; Franco, M.C.; Fr
J.D.; Junqueira, M.L.; Kemper, E.L.; Kitajima, J.P.; Krieger, J.E.; Kuramae, E.E.; La
chado, M.A.; Madeira, A.M.B.N.; Madeira, H.M.F.; Marino, C.L.; Marqueis, M.V.; Martins
A; Authors: Martins, E.M.F.; Matsukuma, A.Y.; Menck, C.F.M.; Miracca, E.C.; Miyaki, C.
F.G.; Nunes, L.R.; Oliveira, M.A.; de Oliveira, M.C.; de Oliveira, R.C.; Palmieri,
Rodrigues, V.; Rosa, A.J. de M.; de Rosa Jr., V.E.; de Sa, R.G.; Santelli, R.V.; Sawa
A; Authors: da Silva, A.C.R.; da Silva, F.R.; da Silva, A.M.; Silva Jr., W.A.; da Silva, A.R.
A; Rethako, M.H.; Vallada, H.; Van Sluys, M.A.; Verjovski-Almeida, S.; Vettore, A.L.
A; Rethako, M.H.; Vallada, H.; Van Sluys, M.A.; Verjovski-Almeida, S.; Vettore, A.L.
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C;Genetics:
A;Gene: XF1231
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conserved hypothetical protein XF1231 [imported] - Xylella fastidiosa (strain C;Species: Xylella fastidiosa C;Date: 18-Aug-22000 #sequence_revision 20-Aug-2000 #text_change 20-Aug-2000
                                                                                                                     PID:917741114; GSPDB:GN00186
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              --EKDGAYTVHITPGPRTKIANVGVAILGDILSDGNLAEYYRNALEN 161
                                                                                                                                                                                                                                                                                                                                              6 TALLLPALFFFPHAYAPAADLSENKAAGFALFKNKSPDTESVKLKPKFPVRIDTQDSE-- 63
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R;anonymous, The Xylella fastidiosa Consortium of the Organization for Ni Nature 406, 151-157, 2000
A;Title: The genome sequence of the plant pathogen Xylella fastidiosa.
A;Reference number: A82515; MUID:20365717; PMID:10910347
A;Note: for a complete list of authors see reference number A59328 below A;Accession: G82706
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                276 ARDGTIPLTIEVSEGKHRYFGVGAQYSTTEGIGLOGYWGHRNLFGQAESLRIEGSVSRIA
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                                                                                                                                                                                                                                                    Query Match 10.1%; Score 320; DB 2; Lo
Best Local Similarity 22.4%; Pred. No. 1.4e-13;
Matches 147; Conservative 92; Mismatches 286;
                                            A Status: preliminary
A Molecule type: DNA
A Residues: 1-617 <KUR>
A Cross-references: GB:AE008688; PIDN:AAL43596.1;
C Experimental source: strain C58 (Dupont)
A Gene: Atu2615
A;Reference number: AB2577; PMID:11743193
A;Accession: AF2897
                                                                                                                                                                                                       A; Map position: circular chromosome
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AL3488
Outer membrane protein BMEI1895 [imported] - Brucella melitensis (strain 16M)
(Species: Brucella melitensis
C; Date: 01-Feb-2002 #sequence_revision 01-Feb-2002 #text_change 01-Feb-2002
C; Accession: AI3488
R; DelVecchio, V.G.; Kapatral, V.; Redkar, R.J.; Patra, G.; Mujer, C.; Los, T.; Ivanov
                                                                                                                                                             25;
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                                                                                                                                                                                                                                                                                                           82 VLDKEQTGF----LAEEAPDNVKTMLRSKGYFSSKVSL---TEKDG-AYTVHITPGPRTK 133
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    : ||: | | : ::|| | : :|| | : :|| | : :|| | : :|| | : :|| | : : :|| | : :|| | : :|| | : :|| | : :|| | : :|| | : :|| | : :|| | : :|| | : :|| | : :|| | : :|| | : :|| | : :|| | : :|| | : :|| | : :|| | : :|| | : :|| | : :|| | : :|| | : :|| | : :|| | : :|| | : :|| | : :|| | : :|| | : :|| | : :|| | : :|| | : :|| | : :|| | : :|| | : :|| | : :|| | : :|| | : :|| | : :|| | : :|| | : :|| | : :|| | : :|| | : :|| | : :|| | : :|| | : :|| | : :|| | : :|| | : :|| | : :|| | : :|| | : :|| | : :|| | : :|| | : :|| | : :|| | : :|| | : :|| | : :|| | : :|| | : :|| | : :|| | : :|| | : :|| | : :|| | : :|| | : :|| | : :|| | : :|| | : :|| | : :|| | : :|| | : :|| | : :|| | : :|| | : :|| | : :|| | : :|| | : :|| | : :|| | : :|| | : :|| | : :|| | : :|| | : :|| | : :|| | : :|| | : :|| | : :|| | : :|| | : :|| | : :|| | : :|| | : :|| | : :|| | : :|| | : :|| | : :|| | : :|| | : :|| | : :|| | : :|| | : :|| | : :|| | : :|| | : :|| | : :|| | : :|| | : :|| | : :|| | : :|| | : :|| | : :|| | : :|| | : :|| | : :|| | : :|| | : :|| | : :|| | : :|| | : :|| | : :|| | : :|| | : :|| | : :|| | : :|| | : :|| | : :|| | : :|| | : :|| | : :|| | : :|| | : :|| | : :|| | : :|| | : :|| | : :|| | : :|| | : :|| | : :|| | : :|| | : :|| | : :|| | : :|| | : :|| | : :|| | : :|| | : :|| | : :|| | : :|| | : :|| | : :|| | : :|| | : :|| | : :|| | : :|| | : :|| | : :|| | : :|| | : :|| | : :|| | : :|| | : :|| | : :|| | : :|| | : :|| | : :|| | : :|| | : :|| | : :|| | : :|| | : :|| | : :|| | : :|| | : :|| | : :|| | : :|| | : :|| | : :|| | : :|| | : :|| | : :|| | : :|| | : :|| | : :|| | : :|| | : :|| | : :|| | : :|| | : :|| | : :|| | : :|| | : :|| | : :|| | : :|| | : :|| | : :|| | : :|| | : :|| | : :|| | : :|| | : :|| | : :|| | : :|| | | : :|| | : :|| | : :|| | : :|| | : :|| | : :|| | : :|| | : :|| | : :|| | : :|| | : :|| | : :|| | : :|| | : :|| | : :|| | : :|| | : :|| | : :|| | : :|| | : :|| | : :|| | : :|| | : :|| | : :|| | : :|| | : :|| | : :|| | : :|| | : :|| | : :|| | : :|| | : :|| | : :|| | : :|| | : :|| | : :|| | : :|| | : :|| | : :|| | : :|| | : :|| | : :|| | : :|| | : :|| |
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                                                                                                                                                             Indels
9.7%; Score 306.5; DB 2; 23.3%; Pred. No. 1.1e-12;
                                                                                                                                                     232;
                                                                                                                                                     89; Mismatches
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8

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C; Accession: AF2089

R; Kancko, T.; Nakamura, Y.; Wolk, C.P.; Kuritz, T.; Sasamoto, S.; Watanabe, A.; Irigu Nakazaki, N.; Shimpo, S.; Sugimoto, M.; Takazawa, M.; Yamada, M.; Yasuda, M.; Tabata DNA Res. 8, 205-213, 2001

A; Title: Complete Genomic Sequence of the Filamentous Nitrogen-fixing Cyanobacterium A; Reference number: AB1807; MUD:21595285; PMID:11759840

A; Status: Preliminary
A; Molecule type: DNA
                                                                                                                                      A;Residues: 1-833 <KUR>
A;Cross-references: GB:BA000019; PIDN:BAB73968.1; PID:917131360; GSPDB:GN00179
A;Experimental source: strain PCC 7120
C;Genetics:
                                                                                                                                                                                                                                                        Score 279; DB 2;
Pred. No. 1.2e-10;
                                                                                                                                                                                                                                                                                                                                                                                        121 AYTVHIT----PGP---RTKI-ANVGV-----
                                                                                                                                                                                                                                                        Score 279;
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.; Mazur, M.; Goltsman, E.; Selkov, E.; Elzer, P.H.; Hagius, S.; O'Callaghan, D.; Letess Proc. Natl. Acad. Scl. U.S.A. 99, 443-448, 2002
A;Title: The genome sequence of the facultative intracellular pathogen Brucella melitens A;Reference number: AD3252: PMID:11756688
A;Accession: A13488
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    hypothetical protein alr2269 (imported) - Nostoc sp. (strain PCC 7120)
C;Species: Nostoc sp.
A;Note: Nostoc sp. strain PCC 7120 is a synonym of Anabaena sp. strain PCC 7120
C;Date: 14-Dec-2001 #sequence_revision 14-Dec-2001 #text_change 30-Jun-2002
                                                                                                                                                                                                                                                                      28;
                                                                               A; Status: preliminary
A; Molecule type: DNA
A; Molecule type: DNA
A; Residues: 1-623 < KUR>
A; Residues: 1-623 < KUR>
A; Cross-references: GB: AE008917; PIDN: AAL53076.1; PID: g17983939; GSPDB: GN00190
A; Experimental source: strain 16M
C; Genetics:
                                                                                                                                                                                                                                                                                                                                                                                             QFLFSRTAISNIAPPPGNRRDKVQTPEEAGFA-PGQEAKSGTILKABRLAVEAWRQ---- 183
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        285
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                                                                                                                                                                                                                                                                                                                                                                                                                                      ----RTKIANV------GVAILGDILSDGNLAEYYRNALENWQQPVGS 168
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      DFDQDSWENSKTSVLGAVTRKGYPLAKLGNTRAAVNPDTATVDLNVVVDSGRPIAFGDFE 228
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        ----- YWTSNVSYNRSTTQ---- 371
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     ------NNKPDPSSGFYLVGNIQPFYEFHYGNFATR-------FTAEGRTYH 477
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       TF-----IIRG--QAGYTVARDNADVPSGLMFRSGCASSVRGYELDSIGLAGPNGSVLP 530
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       -----EGYAKARVTGEDVVADHADNRVSADIALDPGRKAYYGPVS
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                                                                                                                                                                                                                                                                                                                          341 NSFDPKNYTYLLGASFAKPGVYTPDTDFVATLDAKREVLDAYTETSINAKTGFTQIFSDE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    -----NLEKRAFSGGIWYVRD--RAGIDARLGAEFLAEGRKIPGSDIDLGNSHATMLT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         531 ERALLVGSLEYQLPFTRTLSGAVFHDMG----DAAANFKRMKLKHGSGLGVRWFSPLAPF
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    ITGTQRYPEQIVSGLARFQPGTPYDLDLLLDFQQALEQNGHYS--GASVQADFDRLQGD-
                                                                                                                                                                                                                                     Length 623;
                                                                                                                                                                                                                                                                      Indels
                                                                                                                                                                                                                                     DB 2;
                                                                                                                                                                                                                                                                      Conservative 106; Mismatches 248;
                                                                                                                                                                                                                                                      .3e-11
                                                                                                                                                                                                                                     9.2%; Score 290.5; 20.4%; Pred. No. 1.3
                                                                                                                                                                                                                                                                                                                                                                       TGFLAEEAPD - - NVKTMLRSKGYFSSKVSL - - - -
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      -VWDMDKYETTLAAGISQPRNYRGN-----
                                                                                                                                                                                                                                                        No. 1
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                                                                                                                                                                                                                                                        Pred.
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Matches 140;
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conserved hypothetical protein CC1603 [imported] - Caulobacter crescentus C;Species: Caulobacter crescentus C;Species: 20-Apr-2001 #text_change 20-Apr-2001
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      344 ELTKRYQD------GVVTLQVA 376
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                382
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                                                                                                                                                                                                                                                                                                                                                                      EVLDKEQTGFLAEEAPDNVKTMLRSK --------GYFSSKVSLTEKDG 120
                                                                                                                                                                                                                                                                                                                                                                                                                                                                           ---AILGDILSDGNLAEYYR 156
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                602 GYGRVSTRDADGNLRKDGAVFDDNGNRTSEIVPLSFSGTGEDDLLLVQLGAQRDLRNNPL 661
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                284 PLGVRVSFIVQPNPVLSKVEIQANPGTNVPSVLPQATADEIFRAQYGKILNLRDLQEGIK
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      STATEMENT STATEM
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 HPENGHYLDGKIGTTLGTFLSSTALIRTSARACYF-----FTPENKKLGTFIIRGQAGY
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            ----VVDSGRPIAFGDFEITGTQRYPEQIVSGLARFQPGTPYDLDL
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      TVARDNADVPSGLMFRSGGASSVRGYELDSIGLAGPNGSVLPERALLVGSLEYQLPFTRT
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Length 833;
                                                                                                                                                                                       Indels
                                                                                                                                                                                       82; Mismatches 234;
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26;

Gaps

Length 797;

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A;Molecule type: DNA
A;Residues: 1-797 <PAR>
A;Residues: 1-797 <PAR>
A;Crossreferences: GB:AL162752; GB:AL157959; NID:g7378778; PIDN:CAB83401.1; PID:g73, A;Crossreferences: serogroup A, strain 22491
C;Genetics:
A;Gene: omp65; NNA0085
C;Superfamily: protective surface antigen D-15
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Outer membrane protein Omp85 NMB0182 [imported] - Neisseria meningitidis (strain MC5 C; Species: Neisseria meningitidis
C; Species: Neisseria meningitidis
C; Detects: Naisseria meningitidis
C; Detects: Naisseria meningitidis
C; Detects: Naisseria meningitidis
C; Detects: Naisseria meningitidis
R; Tettelin, H.; Sanders, N.J.; Heidelberg, J.; Jeffries, A.C.; Nelson, K.E.; Elsen, Hickey, E.K.; Haft, D.H.; Salzberg, S.L.; White, O.; Fleischmann, R.D.; Dougherty, B. T., H.; Oin, H.; Vamathevan, J.; Gill, J.; Scarlato, V.; Masignani, V.; Pizza, M. Science 287, 1809-1815, 2000
A; Neference Camplete genome sequence of Neisseria meningitidis serogroup B strain MC58. A; Reference number: A81000; MUID: 20175755; PMID: 10710307
A; Rocession: G81228
A; Molecule type: DNA
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 ::: ::|| | | | | | :: | | | ASTSIKQYKTTTAGAGIRMSVPVTEYDKVNFGLVAEHLTVNTYNKAPKHYADFIKKYGKT 558
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        333 SVQPLPNAETKTVDFVLHIEPGRKIYVNEIHITGNNKTRDEVVRRELRQMESAPYDISKL 382
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              LDFQQALEQNGHYSGASVQADFDRLQG--DRVPVKVSVTEVKRHKLETGIRLDSEYGLGG 315
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         KIAYDYYNLFNKGYIGSVVWDMDKYETTL------359
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            -TSNVSYNRSTTQNLEKRAFSGGIWYVRDRAGIDA------RLGAEFLAEGRKI 406
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   RAGYFFTPENK-----KLGTFIIRGQAGYTVARDNA-DVPSGLMFRSGGASSVRGYEL 516
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       --SGTLGPKVYDEYGEKISYGGNKKANVSAELLFPMPGAKDARTVRLSLFADAGSVWDGK 721
                                                                                                                                                                                                                                                                                                                                                                                                    DNVKTMLRSKGYF----SSKVSLTEKDGAYTVHIT--PGPRTKIANVGVAILGDILSDG 149
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               DINEVPRAELEKLLTMKPGKWYE------RQQMTAVLGEIQNRMGSAGYAYSEI- 322
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  NTRAAVNPDTATVDLNVVVDSGRPIAFGDFEITGTQRYPEQIVSGLARFQPGTPYDLDLL 257
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    407 PGSDIDLGNSHATML--TASWKRQLLNNVLHPENGHYLDGKIGTTLGTFLSSTALIRTSA 464
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                NLAEYYRNALE------GYPLAKLG 197
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             DGTD---GSFKGWLYKGTVGWGRNKTDSALWPTRG-YLTG-----VNAEIALPGS
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                                                                                                                                                                                                                                                                                                                                           248; Indels
                                                                                                                                                                                                                                                                           ; DB 2;
6.4e-09;
                                                                                                                                                                                                                                                                 8.0%; Score 253; DB 21.9%; Pred. No. 6.4e-
                                                                                                                                                                                                                                                                                                                                       Conservative
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Best Local Similarity
Matches 135; Conserv
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G81228
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C; Accession: B8748

R; Nierman, W.C.; Feldlyum, T.V.; Paulsen, I.T.; Nelson, K.E.; Eisen, J.; Heidelberg, J.
B: Laub, M.T.; DeBoy, R.T.; Dedson, R.J.; Durkin, A.S.; Gwinn, M.L.; Haft, D.H.; Kolon
D, J.; Ermolaeva, M.; White, O.; Salzberg, S.L.; Shapiro, L.; Venter, J.C.; Fraser, C.M.
A; Et Complete Genome Sequence of Caulobacter crescentus.
A; Reference number: A87249; MUID:21173698; PMID:11259647
A; Ration: preliminary
A; Molecule type: DNA
A; Residues; 1-628 <STO>
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  C;Species: Neisseria meningitidis
C;Date:.05-May-2000 #sequence_revision 05-May-2000 #text_change 02-Feb-2001
C;Accession: D82000
C;Accession: D82000
C;Accession: D82000
C;Accession: D82000
C;Accession: D82000
C;Accession: D82000
C; Klee, S.P.; Morie, S.D.; Churcher, C.; Klee, S.R.; Morie, Folloyd, S.D.; Jagels, K.; Leather, S.; Moule, S.; Mungall, K.; Quail, M.A.; Rajandrean Nature 404, 502-506, 2000
A;Title: Complete DNA sequence of a serogroup A strain of Neisseria menigitidis 22491.
A;Reference number: A81775; MUID:20222556; PMID:10761919
A;Status: preliminary
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 19;
                                                                                                                                                                                                                                                                                                                                                                  A; Cross-references: GB: AE005673; NID: 913423000; PIDN: AAK23582.1; GSPDB: GN00148
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 234 VTKGRTNPEWVGRLAPWVAGDVYDPEDVAELERRLRDTAVYDSISVSLAGTDKASAEGYR 293
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           GISOPRNYRGNYWTS-----NVSYNRSTTQNLEKRAFSGCIWYVRDRAGIDAR-LGAE 398
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   353 EISLP-----HWRRPQQTLKLNSSVFRNDTDAYNETGATVGVDLTRRQTTAYRTFGVS 406
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      RSGGASSVRGYELDSIGLA----GPNGSVLPERALLVGSLEYQLPFTRTLSGAVFHDMGD 559
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          QDSEIKDMVEEHLPLITQQQEEVLDKEQTGFLAEEAPDNVKTMLRSKGYFSSKV--SLTE 117
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  EDRALRDAIGRAL --- SDSKOPPRSRSEARRRARQAGEDAIAVLRAEGYYAYTVEPDVTE 124
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               287 VPVKVSVTEVKRHKLETGIRLDSEYGLGGKIAYDYYNLFNKGYIGSVVWDMDKYETTLAA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      KIGTTLGTFLSSTALIRTSARACYFFTPENKKLGTFI-IRGQAGYTVARDNADVPSGLMF
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          8.6%; Score 272.5; DB 2;
ilarity 23.2%; Pred. No. 2.2e-10;
Conservative 92; Mismatches 285;
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Best Local S
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559

Gaps

331

384 524 485

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probable surface antigen YPO1052 [imported] - Yersinia pestis (strain CO92)
C;Species: Yersinia pestis
C;Species: Yersinia pestis
C;Date: 02-Nov-2001 #sequence_revision 02-Nov-2001 #text_change 09-Nov-2001
C;Accession: AC0129
R;Parkhill, J.; Wren, B.W.; Thomson, N.R.; Titball, R.W.; Holden, M.T.G.; Prentice, M deno-Tarraga, A.M.; Chillingworth, T.; Cronin, A.; Davies, R.M.; Davis, P.; Dougan, G li, M.; Rutherford, K.; Simmonds, M.; Skelton, J.; Stevens, K.; Whitchead, S.; Barrel Nature 413, 523-527, 2001
A;Title: Genome sequence of Yersinia pestis, the causative agent of plague.
A;Reference number: AB0001; MUID:21470413; PMID:11586360
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          A;Cross-references: GB:AL590842; PIDN:CAC89894.1; PID:g15979119; GSPDB:GN00175 C;Genetics: A;Gene: YPO1052 C;Superfamily: protective surface antigen D-15
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   DSEIKDMVEEHLPLITQQQEEVLDKEQTGFLAEEAPDNVKTM---LRSKGYFSSKVSLTE 117
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                                                                                                                                                                                                                                                                                                        DQDSWENSKTSVLGAVTRKGYPLAKLG--NT----RAAVNPDTATVDLNVVVDSGRP1AF
                                                                                                                                                                                                                                                                                                                                                                                225 GDFEITGTQRYPEQIVSGLARFQPGTPYDLDLLLDFQQALEQN·····GHYSGASVQ-
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      385 VRDRAGIDARLGAEFLAEGR-----KIPGSDID------LGNSHATMLTASWK
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    ROLLNNVLHPENGHYLDGKIGTTLGTFLSSTALIRTSARAGYFFTPENKKLGTFI-IRGO
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          332 SVVWDMDKYETTLAAGISQPRNYRGNYWTSNVSYNR----STTQNLEKRAFSGGI---WY
                                                                                                      Indels 120;
                                                               Length 778;
                                                     Conservative
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Best Local Similarity
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A;Molecule type: DNA
A;Residues: 1-795 <KUR>
                                                                                                    Matches 137;
    C;Genetics:
A;Gene: omp
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cuter membrane protein - Aquifex aeolicus
C; Species: Aquifex aeolicus
C; Species: Aquifex aeolicus
C; Species: Aquifex aeolicus
C; Date: 08-May-1998 #sequence_revision 08-May-1998 #text_change 05-Nov-1999
C; Accession: C70412
R; DecKert, G; Warren, P.V.; Gaasterland, T.; Young, W.G.; Lenox, A.L.; Graham, D.E.; Ov V.
Nature 392, 353-358, 1998
A; Title: The complete genome of the hyperthermophilic bacterium Aquifex aeolicus.
A; Reference number: A70300; MUID:9819666; PMID:9537320
A; Accession: C70412
A; Residus: preliminary; nucleic acid sequence not shown; translation not shown
A; Molecule type: DNA
A; Molecule type: DNA
A; Residues: 1-778 cAOF>
A; Residues: 1-778 cAOF>
A; Residues: 1-778 cAOF>
A; Experimental source: strain VF5
                  A;Cross-references: GB:AE002375; GB:AE002098; NID:g7225394; PIDN:AAF40639.1; PID:g72254C
A;Experimental source: serogroup B, strain MC58
C;Genetics:
                                                                                                                                                                                   26;
                                                                                                                                                                                                                                                                                                                                   DINEVPRAELEKLLTMKPGKWYE------RQQMTAVLGEIQNRMGSAGYAYSEI- 322
                                                                                                                                                                                                                                                                                                                                                                                257
                                                                                                                                                                                                                                                                                                                                                                                                    SVQPLPNAETKTVDFVLHIEPGRKIYVNEIHITGNNKTRDEVVRRELRQMESAPYDTSKL 382
                                                                                                                                                                                                                                                                                                                                                                                                                                                                              516
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                                                                                                                                                                                                                   DNVKTMLRSKGYF----SSKVSLTEKDGAYTVHIT--PGPRTKIANVGVAILGDILSDG 149
                                                                                                                                                                                                                                                             274
                                                                                                                                                                                                                                                                                                NLAEYYRNALE-----GYPLAKLG 197
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    316 KIAYDYYNLFNKGYIGSVVWDMDKYETTL------AAGISQPRNYRGNYW---- 359
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           SAGVSQDNLFGTG--KSAALRASRSKTTLNGSLSFTDPYFTADGVSLGYDVYGKAFDPRK 498
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  -TSNVSYNRSTTQNLEKRAFSGGIWYVRDRAGIDA------RLGAEFLAEGRKI 406
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       604
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                                                                                                                                                                                   Gaps
                                                                                                                                                                                                                                              NTRAAVNPDTATVDLNVVVDSGRPIAFGDFEITGTQRYPEQIVSGLARFQPGTPYDLDLL
                                                                                                                                                                                                                                                                                                                                                                                                                                                          LDFQQALEQNGHYSGASVQADFDRLQG--DRVPVKVSVTEVKRHKLETGIRLDSEYGLGG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            RAGYFFTPENK - - - - - - KLGTFIIRGQAGYTVARDNA - DVPSGLMFRSGGASSVRGYEL
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                                                                                                                                       Length 797;
                                                                                                                                                                                Indels
                                                                                                                                     Query Match
8.0%; Score 253; DB 2;
Best Local Similarity 21.9%; Pred. No. 6.4e-09;
Matches 135; Conservative 89; Mismatches 248
                                                                            A;Gene: NMB0182
C;Superfamily: protective surface antigen D-15
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  <TET>
A; Residues: 1-797
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Outer membrane protein precursor yaeT [imported] - Salmonella enterica subsp. enterica serovar Typhi
C;Species: Salmonella enterica subsp. enterica serovar Typhi
A;Note: this species has also been called Salmonella typhi
C;Date: 09-Nov-2001 sequence_revision 09-Nov-2001 #text_change 27-Nov-2001
C;Accession: AB0530
R;Parkhill, J; Dougan, G; James, K.D.; Thomson, N.R.; Pickard, D.; Wain, J.; Churcr th, T.; Connerton, P.; Cronin, A.; Davis, P.; Davies, R.M.; Dowd, L.; White, N.; Far S.; Moule, S.: O'Gaora, P.
Nature 413, 848 8952, 2001
A;Authors: Parry, C.; Ouall, M.; Rutherford, K.; Simmonds, M.; Skelton, J.; Stevens, A;Title: Complete genome sequence of a multiple drug resistant Salmonella enterica s A;Accession: AB0502; PMID:11677608
A;Accession: AB0503
A;Status: preliminary
A;Molecule type: DNA
A;Residues: 1-803 <ARP>
A;Cross-references: GB:AL513382; PIDN:CAD08682.1; PID:g16501505; GSPDB:GN00176
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  529
                                                                                                                                                                                                                                                                                                                                                                                                                                                                         240
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              : |:|| | : ::| | || 442 VGLQQDNFLGSGNRVGVNAMINDYQKN-----LTLEYRDPYWNLDGVSLGGKV---FY 491.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | :: | :: | | AGNHQRAFYKMTVPG--SDAQYFKLQYDVRQYFPLTKKHEFTLLLLRGRLGYGNGYGQTDG 643
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                :|| | :|| :|| :|| :|| :|| 644 KDNL-FPFYENFYAGGFTSLRGFGSNS---AGPKAVYRDYSGSNNGSDTATDDSVGGNAI 699
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           : |: | : | : | : | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... |
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               --SGLARFQ-----GHYSGASVQ 276
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             382 IETGKTRLNRLGFFETVEVQTVRVPGSEDQVDLVYSVKEANSGNVNPGVGYGTESGVSPQ 441
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             277 ADFDR-----GGBRVPVKVSVTEVKRHKLETGIRLDSEY-------GLGGKIAYDYY 322
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    NLFNKGYIGSVVWDMDKYETTLAAGISQPRNYRGNYWTSNVSYNRSTTQNLEKRAFSGGI 382
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               WYVRDRAG-IDARLGAE-FLAEGRKIPGSDIDLGNSHAT---MLTASWKRQLLNNVLHPE 437
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     530 GYTHNKIGNLTPYLQVENFLA----AQASNIDSGGNLLTDDFDINLSWTRNNLNNSYFPT 585
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             RDNADVPSGLMFRSGGASSVRGYELDSIGLAGP-----NGS-----VLPERAL 534
                                                                                                                                                                                                                       84 DKEQTGFLAEEAPDNVKTMLRSKGYFSSKVSLT-----EKDGAY-TVHITPGPRTKIAN 136
                                                                                                                                                                                                                                                                                                                                                     137 VGVAILGDILSDGNLAEYYRNALENWOOPVGSDFDQDSWENSKTSVLGAVTRKGYPLAKL 196
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      NGHYLDGKIGTTLGTFLSSTALIRTSARAGYFFTPENKKLGTFIIRGQAGY----TVA 491
                                                                                                                                                                Gaps
                                                                                                                                                                                                                                                                                                                                                                                     --VQFRGELM--GKEAEF--TSLIPFE--IGETYNGSAVTRLEESVKKVLGESGYAYPQV
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                                                                                                                                                                                                                                                                                    DKYKKQVLAGDI-EALRTYYLDRGYLKFQVDSTQVAISPDKKGVYITLNLNEGEPYTVSK
                                                                                                                                                          95; Mismatches 225; Indels 168;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    535 LVGSLEYQLP----FTRTLSGAVFHDMG---DAAANFKRMKLKHGS--
                                                                                                                                                                                                                                                                                                                                                                                                                                                                            GNTRAAVNPDTATVDLNVVVDSGRPIAFGDFEITGTQRYPEQIV--
                                                                                                ; DB 2;
3.6e-07;
   A;Map position: 1
C;Superfamily: protective surface antigen D-15
                                                                                                Score 227;
Pred. No.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              ----GLGVRWFSPLAPFSFDIA 591
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YRSSYGVALQWVSPMGPLVFSLA 781
                                                                                                7.28;
21.78;
                                                                                                                                                             Conservative
                                                                                                                                Local Similarity
                                                                                                Query Match
Best Local Simi
Matches 135;
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A; Status: prelimary
A; Molecule type: DNA
A; Residues: 1-803 < HEI>
A; Cross-references: GB: AE004297; GB: AE003852; NID: g9656810; PIDN: AAF95396.1; GSPDB: GN001
A; Experimental source: serogroup 01; strain N16961; biotype El Tor
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Surface antigen VC2252 [imported] - Vibrio cholerae (strain N16961 serogroup O1)
C;Species: Vibrio cholerae
C;Species: Vibrio cholerae
C;Date: 18-Aug-2000 #sequence_revision 20-Aug-2000 #text_change 02-Feb-2001
C;Accession: B82099
R;Heidelberg, J.F.: Eisen, J.A.; Nelson, W.C.; Clayton, R.A.; Gwinn, M.L.; Dodson, R.J.
Chardelberg, J.F.: Eisen, J.A.; Nelson, W.C.; Clayton, R.A.; Gwinn, M.L.; Dodson, R.J.
I, R.R.; Mekalanos, J.J.; Venter, J.C.; Fraser, C.M.
Nature 406, 477-483, 2000
A;Title: DNA Sequence of both chromosomes of the cholera pathogen Vibrio cholerae.
A;Reference number: A82035; MUID:20406833; PMID:10952301
                                                                   30;
                                                                                                                                                                                                                                                 ILGDILSDGNLAEYYRNALENWQQPVGSDFDQDSWENSKTSVLGAVTRKGYPLAKLGNTR 200
                                                                                                                                                                                                                                                                                                                                                                                                                                        -LNSVIVSGNLAGHQSEAEKLTKIEPGELFNGSKVTRMEDDIKKMLGRYGYAYPRV-VTQ 325
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      :| | | | | | : : | | | 326 PEINDDDKTVKLHINVDAGNRFYVRHIRFEGNDTSKDSVLRREWRQMEGAWLGNDQVEAG 385
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          QQALEQNGHYSGASVQADFDRLQG-.DRVPVKVSVTEVKRHKLETGIRLDSEYGLGGKIA 318
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 444 VQQDNWLGTGNTVGINGTKNDYQTYAEFTLMDP-----YFTVDGVSLGGRIFYNDFKAD 497
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     ---FTPENKKLGTFII-RGQAGYTVARDNADVPSGLMFRSGGASSVRGY 514
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       ELDSIGLAG---PNG-----SVLPERALLVGSLEYQLP-----FTRTLSGAVFHD 556
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 201 AAVNPDTATVDLNVVVDSGRPIAFGDFEITGTQRYPEQIVSGLARFQPGTPYDLDLLLDF 260
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 NLEKRAFSGGIWYVRDRAGIDARLGAEFLAEGRKIPGSDIDLGNSH---ATML--TASWK 426
                                                                   Gaps
                                                                                                                                                                YDYYNLFNKGY IGSVVWDMDKY ETTLAAG I SQPRNYRGNYWT - - - - - SNVSYNRSTTQ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         427 ROLLNNVLHPENGHYLDGKIGTTLGTFLSSTALIRTSARAGYF---------
      Length 795;
                                                                                                                             VKLKPKFPVRIDTQDSEIKDMVEEHLPLITQQQEEVLDKEQTGFLAEEAP-
7.8%; Score 246; DB 2; I 21.2%; Pred. No. 1.9e-08; tive 105; Mismatches 273;
                                                                Conservative 105;
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                                   Similarity
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                                      Best Local Sim
Matches 142;
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         Query Match
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Gaps

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394 327

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hypothetical protein ECs0179 [imported] - Escherichia coli (strain O157:H7, substrain Cispecies: Escherichia coli Cisteria coli Cispecies: Escherichia coli Cisteria coli Cisteria coli Cisteria (strain O157:H7, substrain Cisteria: 18-ulu-2001 #sequence_revision 18-Jul-2001 #text_change 03-Aug-2001 Cisteria: C90651 R: Hayashi, T.; Makino, K.; Ohnishi, M.; Kurokawa, K.; Ishli, K.; Yokoyama, K.; Han, C gasawara, N.; Yasunaga, T.; Kuhara, S.; Shiba, T.; Hattori, M.; Shinagawa, H. A/Title: Complete genome sequence of enterchemorrhagic Escherichia coli O157:H7 and gasteria: Complete genome sequence of enterchemorrhagic Escherichia coli O157:H7 and gasteria: Preliminary A/Molecule type: DNA A/Molecule
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         DNVKTMLRSKGYF----SSKVSLT-EKDGAY-TVHITPGPRTKIANVGVAILGDILSDG 149
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        363 VSYNRSTTQNL---EKRAFSGGIWYVRDR-AGIDARLGA-EFLAEGRKIPGSDIDLGNSH 417
                                                                                                                                                          GYAVGINGTKNDYOTYAELSVTNP-----YFTVDGVSLGGRLFYNDFQADDADLSDYTN
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                                                                                                                                                                                                                                                          210 VDLNVVVDSGRPIAFGDFEITGTQRYPEQIVSGLARFQPGTPYDLDLLLDFQQALEQNGH
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                            Length 810;
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                       6.8%; Score 217; DB 2; L 20.5%; Pred. No. 1.7e-06; tive 93; Mismatches 253;
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Pred. No. 1.7e-06;
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C;Superfamily: protective surface antigen D-15
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Apporterical protein b0177 - Escherichia coli (strain K-12)
C; Species: Escherichia coli
C; Species: Escherichia coli
C; Species: Escherichia coli
C; Species: 12-Sep-1997 *sequence_revision 17-Sep-1997 *text_change 01-Mar-2002
C; Accession: A64742
R; Blattner, F.R.; Plunkett III, G.; Bloch, C.A.; Perna, N.T.; Burland, V.; Riley, M.; G. N. S.; Mau, B.; Shao, Y.
A: Rose, D.J.; Mau, B.; Shao, Y.
A: Rose, D.J.; Mau, B.; Shao, Y.
A; Title: The complete genome sequence of Escherichia coli K-12.
A; Reference number: A64720; MUID:97426617; PMID:9278503
A; Title: The complete acid sequence not shown; translation not shown
A; Residues: 1-810 <=BLAT>
A; Molecule type: DNA
A; Residues: 1-810 <=BLAT>
A; Cossion: A6475
A; Experimental source: strain K-12, substrain MG1655
C; Superfamily: protective surface antigen D-15
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                                           Query Match 7.1%; Score 226; DB 2; Length 803; Best Local Similarity 20.1%; Pred. No. 4.2e-07; Matches 136; Conservative 102; Mismatches 284; Indels 154;
C; Superfamily: protective surface antigen D-15
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Matches 127; Conservative 93; Mismatches 253; Indels 148; Ga	
DD 224 ETLESYYLDRGYARFNIDSTQVSLTPDDKKGIYVNITEGDQYKLSGVEVSG 275	OY 150 NLAEYYRNALENWQQPVGSDFDQDSWENSKTSVLGAVTRKGYPLAKLGNTRAAVNPDTAT 209 1   : : : :         Db 276 NLAGHSAETFOLTK FPDGEL, NGTKVTK MEDDIKK I, GRYGYA Y PRV-OSMPETNDAKT 334
Qy 150 NLAEYYRNALENWQQPVGSDFDQDSWENSKTSVLGAVTRKGYPLAKLGNTRAAVNPDTAT 209	210 VDLNVVVDSGRPIAFGDFEITGTQRYPEQIVSGLARFQPGTPYDLDLLLDFQQALEQNGH
Qy 210 VDLNVVVDSGRPIAFGDFEITGTQRYPEQIVSGLARFQPGTPYDLDLLLDFQQALEQNGH 269	Db 335 VKLRVNVDAGNRFYVRKIRFEGNDTSKDAVLRREMRQMEGAWLGSDLVDQGKERLNRLGF 394  QY 270 YSGASVQADFDRLQGDRVPVKVSVTEVKRHKLETGIRLDSEYGLGGKIAYDYYNLFNK 327
**************************************	GSP
	Db 453 GYAVGINGTKNDYQTYAELSYTNPYFTVDGVSLGGRLFYNDFQADDADLSDYTN 506 QY 363 VSYNRSTTQNLEKRAFSGGIWYVRDR-AGIDARLGA-FFLAEGRKIPGSDIDLGNSH 417
OY 363 VSYNRSTTONLEKRAFSGGIWYVRDR-AGIDARLGA-EFLAEGRKIPGSDIDLGNSH 417	
OY 418 ATMLTASWKRQLLNNVLHPENGHYLDGKIGTTLGTFLSSTALIRT 462	566 KTDDFTENYGWTYNKLDRGYFPTDGSRVNLTGKVTIPGSDNEYYKVTLDT
Qy 463 SARAGYFFTPENKKLGTFIIRGQAGYTVARDNADVPSGLMFRSGGASSVRGYELDSIG 520      :   . ::     ::     ::     Db 616ATYVPIDDDHKWVVLGRTRWGYGDGLGGKEMPFYENFYAGGSSTVRGFOSNTI- 668	DD   616ATYVPIDDDHKWVVLGRTRWGYGDGLGGKEMPFYENFYAGGSSTVRGFQSNT1- 668   QY   521 LAGPNGSVLPER
Qy 521 LAGPNGSVLPER 544	669GPKAVYFPHQASNYDPPDYDYECATQDGAKDLCKSDDAVGGNAMAVASLEFITPTPFIS 545FTRTLSGAVFHDMGDA-AANFKRMKLKHGSGLGVRWFSPLAPFSFD : ::
QY 545FTRTLSGAVFHDMGDA-AANFKRMKLKHGSGLGVRWFSPLAPFSFD 589    1	Db 727 DKYANSVRTSFFWDMGTVWDTNWDSSQYSGYPDYSDPSNIRMSAGIALQWMSPLGPLVFS 786 Oy 590 IAYGHSDKKIRWHISLG 606
	Db 787 YAQPFKKYDGDKAEQFQFNIG 807
787 YAUFRANIDEDRAEQFORNIG 807	RESULT 26 H83190 probable outer membrane protein PA3648 [imported] - Pseudomonas aeruginosa (strain p^
bstrain EDL93	C;Species: Pseudomonas aeruginosa C;Date: 15-Sep-2000 #sequence_revision 15-Sep-2000 #text_change 31-Dec-2000 C:Accession: H83190 R;Stover, C.K.; Pham, X.Q.; Erwin, A.L.; Mizoguchi, S.D.; Warrener, P.; Hickey, M.J.,
D.J.; Mayhew K.; Apodaca,	Lory, S.; Olson, M.V. Nature 406, 959-964, 2000 A.Title: Complete genome sequence of Pseudomonas aeruginosa PA01, an opportunistic p
A:Tills: Genome sequence of enterohemorrhagic Escherichia coli 0157:H7. A:Reference number: A85480; MUID:21074935; PMID:11206551 A:Accession: C85502	A; Mererence number: A82950; MUID: 2043/33/; PMID: 10984043 A; Accession: H83190 A; Status: preliminary A; Molecule type: DNA
145; UWGP:Z01	A; Residues: 1-797 <sto> A; Residues: 1-797 <sto> A; Cross-references: GB: AE004784; GB: AE004091; NID: 99949799; PIDN: AAG07036.1; GSPDB: GA: Experimental source: strain PAO1 C; Genetics: A; Gene: PA3648 C; Genetics: Af Gene PA3648</sto></sto>
n ly: protective surface antigen D-15	Query Match 6.8%; Score 215.5; DB 2; Length 797;
tch 6.8%; Score 217; DB 2; Length 81 cal Similarity 20.5%; Pred. No. 1.7e-06;	20.0%; Pred. No. 2.1e-06; stive 83; Mismatches 240;
ative 93; Mismat	Qy 105 SKGYFSSKVSLTEKDGAYTVHITPGPRTKIANVGVAILGD-ILSDGNL 151   :

us-09-857-669-2.rpr

DD 115 TPELQEIIROVIKTOTGGDTSOTOLORDVAAILETGLEASANVNSR 160  OY 126 ITTCCPRTK IANYCVALGDILSDGALAEYTRNALENMQDEVGSDEPGDSWENSKTSVLGA 185  161 TTPSGLAVVYQVOPVIVSLGLTGAKALTYSVAQDFPCSOGGRPISPEGIKGAVQVNOW 220  162 TYRGYPLAKLGWTRAA	PESULT 28 PRESULT 201 #scentus C:Species: Caulobacter creacentus C:Species: Caulobacter creacentus C:Date: 20-Apr-2001 #scequence_revision 20-Apr-2001 #text_change 20-Apr-2001 C:Accession: F88486 R:Nierman, W.C.; Feldblyum, T.V.; Paulsen, I.T.; Nelson, K.E.; Eisen, J.; Heidelberg, B.; Laub, M.T.; DeBoy, R.T.; Doddon, I.T.; Nelson, K.E.; Eisen, J.; Heidelberg, B.; Laub, M.T.; DeBoy, R.T.; Doddon, I.T.; Nelson, K.E.; Eisen, J.; Haft, D.H.; Ko proc. Natl. Acad Sci. U.S.A. 98, 4136-4141, 2001 A;Title: Complete Genome Sequence of Caulobacter crescentus. A:Reference number: A87249; MUID:21173698; PMID:11259647 A:Recession: F87486 A:Scatus: preliminary A;Molecule type: DNA A;Residues: 1-769 < 4270-5 A;Cross-references: GB:AE005673; NID:g13423368; PIDN:AAK23890.1; GSPDB:GN00148 A;Residues: 1-769 < 4270-5 A;Genet.Cs: A;Genet.C
152 193 193 205 205 255 308 304 428 361 480 480 480 480 480 480 536 536 536 512 512 512 513 511	RESULT 27 AE2417 Hypothetical protein alr4893 [imported] - Nostoc sp. (strain PCC 7120) Cippedies: Nostoc sp. Strain PCC 7120 is a synonym of Anabaena sp. strain PCC 7120 Cipate: 14-Dec-2001 *Sequence_revision 14-Dec-2001 *text_change 30-Jun-2002 Cipate: 15-Sequence_revision 14-Dec-2001 *text_change 30-Jun-2002 Nakazaki, N.; Shimpo S.; Sugimoto, M.; Takazawa, M.; Yasada, M.; Yasuda, M.; Tabata, S. Aitte: Complete Genomic Sequence of the Filamentous Nitrogen-fixing Cyanobacterium Ana A:Title: Complete Genomic Sequence of the Filamentous Nitrogen-fixing Cyanobacterium Ana A:Restuces: preliminary A:Roteure type: DNA A:Restuces: 1-676 <a href="https://documerration.com/lipate/">https://documerration.com/lipate/"&gt;https://documerration.com/lipate/</a> A:Restuces: 1-676 <a href="https://documerration.com/">https://documerration.com/</a> A:Genetics: A:Geneti

DD 233 FDFRVISSVAELAPDKNGFAVTYTLEEGPKYKFGKITVETELKKL-DGNLLAQI 285	
QY 162 WQQPVGSDFDQDSWENSKTSVLGAVTRKGYPLAKLGNTRAAVNPDTATVDLNVVVDSG 219	GLAREQPGTPYDLDLLLC
220 RPIAFGDFEITGTQRYPEQIVSGLARFQPGTPYDLDLLLDFQQALEQNGHYSGASVQADF 27 : 1   1   1   1   1   1   1   1   1   1	Db 344 LTVRQLRFEGNTVSADSTLRQEMRQQEGTWYNSQLVELGKIRLDRTGFETVENRIDP 401 Qy 282 LQGDRVPVKVSVTEVKHKLETGIRLDSEYGLGGKIAYDRYNLFNKGYIGSVWDMDK 339 :
280 DRLQGDRVPVKVSVTEVKRHKLETGIRLDSEYGLGGKIAYDYYNLFNKGYIGSVVWDWDK 33   1   1   1   1   1   1   1   1   1	402 INGSNDEVDVVYKVKERNTGSINFGIGYGTESGISYQASVKQDNFLGTGAAVSIAGTKND 340 YETTLAAGISOPRNYKGNYWTSNVSYNRS-TTONLEKRAFSGGIWYVRDRA
OY 340 YETTLAAGISQPRNYRGNYWTSNVSYNRSTTQNLEKRAFSGGIWYVRDRAGIDAR-LG 396	462 YGTSVNIGYTEPYFTKDGVSLGGNVFFENYDNSKSDTSSNYKRTTYGSNVTLGFPVNENN 390 GIDARLGAEFLAEGRKIPGSDIDLGNSHATMLTASWKRQLL
0y 397NEFLAEGRKIPGSDIDLGNSHATMLTA 423 :	522 SYYQLGHTYNKISNFALEYNKNLYIQSMKFKGNGIKTNDFDFSFGWNYNSL 431 NNVLHPENGHYLDGKIGTTLGTFLSSTALIRTSARAGYFFTPENKKLGTFIIRGOAGYTV
OY 424 SWKRQLLNNVLHPENGHYLDGKIGTTLGTFLSSTALI 460	491 ARDNADVPSGLMFRSGGASSVRGYELDSIGLAGPNGSVLPE
OY 461 RTSARAGYFFTPENKKLGTFIIRGQAGYTVARDNADVPSGLMFRSGGASSVRGYELDS 518	532 GFGNKRLFFYQTYTAGGIGSLKGFAYGSIGFNAIYAEYGNGSGIGTFKKISSDVIGG 532 RALLVGSLEYQLPFTRTLSGAVFHDMGDAAANFKRM
OY 519 IGLAGPNGSVLPERALLYGSLEYQLPPTRTLSGAVFHDMGDAA 561	689 NAIATASAELIVPTPFVSDKSONTVRTSLFVDAASVWNTKWKSDKNGLESD 568KLKHGSGLGVRWFSPLAPFSFDIAYGHSDKKIRWHISLGTRF ::::::::::::::::::::::::::::::::::::
QY 562AMFK-RMKLKHGSGLGVRWFSPLAPFSFDIAYGHSDKKIRWHISLGTRF 609  12 GVFDPNIKDNLGLRASAGISIDWKSPMGPIRFDISRILSKEDYDRTETFRFSTSTRF 768	DD 749 KSSRIRASTGVGFQMQSPIGPLVFSYAKPIRKYENDDVE-QFQFSIGGSF 797 RESULT 30
	F64102 protective surface antigen D-15 - Haemophilus influenzae (strain Rd KW20) C;Species: Haemophilus influenzae C;Date: 18-Aug-1995 #sequence_revision 18-Aug-1995 #text_change 18-Sep-1998
	Cynccession: realoz R;Fleischmann, R.D.; Adams, M.D.; White, O.; Clayton, R.A.; Kirkness, E.F.; Kerlavag ; Gocayne, J.D.; Scott, J.; Shirley, R.; Liu, L.I.; Glodek, A.; Kelley, J.M.; Weldma, , D.M.; Brandon, R.C.; Fine, L.D.; Fritchman, J.L.; Fuhrmann, J.L.; Geoghagen, N.S.M
ophilus infil	Science 269, 496-512, 1995 A;Authors: Gnehm, C.L.; McDonald, L.A.; Small, K.V.; Fraser, C.M.; Smith, H.O.; Vent A;Title: Whole-genome random sequencing and assembly of Haemophilus influenzae Rd.
	A; Accession: F64102 A; Status: nucleic acid sequence not shown; translation not shown A; Molecule type: DNA
A; Residues: 1-797 <fla> A; Residues: 1-797 <fla> A; Cross-references: GB:U13961; NID:g537447; PIDN:AAA85645.1; PID:g537448 A; Experimental source: type b C; Superfamily: protective surface antigen D-15</fla></fla>	A;Residues: 1-808 <ticr> A;Cross-references: GB:L42023; TIGR:HI0917 C;Superfamily: protective surface antigen D-15 C;Keywords: surface antigen</ticr>
	Query Match 6.6%; Score 209.5; DB 2; Length 808; Best Local Similarity 20.0%; Pred. No. 5.4e-06; Marches 130: Conservative 103: Mismatches 277: Indels 141; Gaps 24;
Query Match 6.6%; Score 209.5; DB 2; Length 797; Best Local Similarity 20.0%; Pred. No. 5.3e-06; Matches 130; Conservative 103; Mismatches 280; Indels 137; Gaps 24;	61 DSEIKDMVEEHLPLITQQQEEVLDKEQTGFLAEEAPDNVKTMLRSKGYFSSKVSLT 116
Qy 61 DSEIKDMVEEHLPLITQQQEEVLDKEQTGFLAEEAPDNVKTMLRSKGYFSSKVSLT 116 :  ::  :  :  :     : :::    Db 184 ESVSSSTLQEQMELQPDSWWKLWGNKFEGAQFEKDLQSIRDYYLNNGYAKAQITKTDVQL 243	117EKDGA-YTVHITPGPRTKIANVGVAILGDILSDGNLAEYYRNALENWQOP
Qy 117EKDGA-YTVHITPGPRTKIANVGVAILGDILSDGNIAEYYRNALENWQQP 165  Db 244 NDEKTKVNVTIDVNEGLQYDLRSARIIGNIAGMSAELEPLLSALHLNDTFRRS 296	166
OV 166 VGSDFPNDSGENSKTSVI GAUFPKGYDI AKI GNEPAAVNDDTATUDI MAAVNEGED 221	Db 310DIADVENAIKAKLGERGYGSATVNSVPDFFDDANKTLAITLVVDAGRR 356

Qy 222 I	IAFGDFEITGTQRYPEQIVSGLARFQPGTPYDLDLLLDFQQALEQNGHYSGASVQADFDR 281	ò	211 DLNVVVDSGRPIAFGDFEITG231
; Db 357 L	:	a a	:   :   :
Oy 282 Ld	LOGDRVDVKVSVTEVKRHKLETGIRLDSEYGLGGKIAYDYYNLFNKGYIGSVVWDMDK 339 :	Qy	232TQRYPEFQ 247 :     :     :     :   309 ADLGYAFVEVYPDIQKNDGTQEATVVFKVIPHDKVYIRNVIISGNSRTVDRVIRRELYIT 368
Qy 340 YI I Db 475 Y	340 YETTLAAGISQPRNYRGNYWTSNVSYNRS-TTQNLEKRAFSGGIWYVRDRA 389	Qy	
Qy 390 G Db 535 S	GIDARLGAEFLAEGRKIPGSDIDLGNSHATMLTASWRRQLL 430	Qy Db	308 DSEYGLGGKIAYDYYNLFNKGYIGSVVWDMDKYETTLAAGISOPRNYRGNYWTSNVSY 365                               10
Oy 431 NI     Db 587 NI	NNVLHPENGHYLDGKIGTTLGTFLSSTALJRTSARAGYFFTPENKKLGTFIIRGQAGYTV 490 	Qy Dp	
Oy 491 Ai Db 645 GI	ARDNADVPSGLMFRSGGASSVRGYELDSIGLAGPNGSVLPERA 533	Oy Op	412DLGNSHATMLTASWKRQLLANVLHPENGHYLDGKIGTTLGTFLSSTALIRTSARA 466 :     :    :    :        533 LRTGYELGKSIKSSITPAITFNDTDDYYLPRSGIIASTSLEYAGLGG 579
Oy 534 LI : Db 702 II	LLVGSLEYQLPFTRTLSGAVFHDMGDAAANF	Qy	467 GYFFTPENKKLGTFIIRGQAGYTVARDNADVPSGLMFRSGCASSVRGYE 515
Oy 565 -1 Db 759 Gi	-KRMKLKHGSGLGVRWFSPLAPFSFDIAYGHSDKKIRWHISLGTRF 609   .:: : :	Oy Db	516 LDSIGLAGPNGSVLPERALLVGSLEYQLPFTRTLSGAVFHDMGDAAANFKRMKL 569 1
RESULT 31 A81430 outer membra C:Species: C	ane protein Cj0129c [imported] - Campylobacter jejuni (strain NCTC 11168) Campylobacter 1ejuni	Oy Op	570 KHGSGLGVRWESPLAPFSFDIAYGHSDKKIRWHISLGTRF 609   :  :  :
C; Date: 31-; C; Accession R; Parkhill, C.W.; Quail	C;Date: 31.Mar-2000 #sequence_revision 31.Mar-2000 #text_change 03-Jun-2002 C;Accession: A81430 R;Parkhill, J.; Wren, B.W.; Mungall, K.; Ketley, J.M.; Churcher, C.; Basham, D.; Chillin C.W.; Quall, M.; Rajandream, M.A.; Rutherford, K.M.; VanVliet, A.; Whitehead, S.; Barrel	RES S77 hyp C;S	RESULT 32 877409 hypothetical protein - Synechocystis sp. (strain PCC 6803) C.Species: Synechocystis sp.
A; Title: The A; A; Reference A; Accession: A; Status: Dr	bb3-bb4, 2000 e genome sequence of the food-borne pathogen Campylobacter jejuni reveals hyp number: A81250; MUID:20150912; PMID:10688204 : A81430 : A814310	Y C C C X	A;Variety: PCC 6803 C;Date: 25-Apr-1997 #sequence_revision 25-Apr-1997 #text_change 08-Oct-1999 C;Accession: S77409 R;Kaneko, T:: Sato, S;; Kotani, H.; Tanaka, A.; Asamizu, E.; Nakamura, Y.; Miyajima,
A; Molecule A; Residues: A; Cross-refe	type: DNA 1-739 <par> erences: GB:AL139074; GB:AL111168: NID:q6967505: PIDN:CAH72613.1: PID:d696763</par>	DONA T. A	N.; Okumura, 5.; Inimpo, 5.; Takeuchi, C.; Wada, T.; Watanabe, A.; Yambda, M.; Yas Res. 3, 109-136, 1996 Itle: Sequence analysis of the genome of the unicellular cyanobacterium Synechocys
A; Experimen C; Genetics: A; Gene: Cj0]	tal source: serotype O2, strain NCTC 11168	A A A	acession: S77409  adus: nucleic acid sequence not shown; translation not shown
Query Match Best Local Matches 14	<pre>// Match 6.5%; Score 206; DB 2; Length 739; Local Similarity 18.3%; Pred. No. 8.1e-06; hes 140; Conservative 102; Mismatches 312; Indels 210; Gaps 24;</pre>	A A A	A;Motecute type: UNA A;Residuca: 1-861 <kran> A;Cross-references: EMBL:D90906; GB:AB001339; NID:g1652492; PIDN:BAA17512.1; PID:d101 A;Note: the nucleotide sequence was submitted to the EMBL Data Library, June 1996</kran>
	19 AYAPAADLSENKAAGFALFKNKSP-DTESVKLKPKF-PVRIDT	C; &	C;Genetics: A;Start codon: GTG
DD 13 AV QY 60 QE	13 AMANAATIKDIKFIGLNHLSNTSAINIAGLKIGEEINPAKINTAILNLYKQNYFENIAVE 72 60 QDSEIKDMVEEHLPLITQQQEEVLDKEQTGFLAEEAPDNVKTML 103 ::   ::     ::	0 112	Ouery Match 6.4%; Score 202.5; DB 2; Length 861; Best Local Similarity 20.4%; Pred. No. 1.8e-05; Matches 131; Conservative 77; Mismatches 254; Indels 179; Gaps 23;
Db 73 NN Qy 104 RS	73 NNNGILEIIVTEKPTIAKVTITGIASNDRKQVESILGIKRGTLLDEGNIKEAIERIKAYY 132 104 RSKGYFSSKVSLTEKDGAYTVHITPGPRTK-IANVGVAILGDILSDGNLAEYYRNALENW 162	Qy Bp	76 TOQOBEVLDKEOTGFLABEAPDNVKTMLRSKGYFSSKVSLTEKDGAYTVHITPGPRTKIA 135
Db 133 EA	:	οy	
Oy 163 OC Db 189 VV	163 QQPVGSDFDQDSWENSKTSVLGAVTRKGYPLAKLGNTRAAVNPDTATV 210 18	do yo	334 FTGLNIRTVPETAEGKERILPQEVVDETFGEQYGKILNLRELQEGIKTINEWYSN 388 183 LGAVTRKGYPLAK-LGNTRAAVNPDTATVDLNVVVDSGRPTAFGPFITGTORYPFOTVS 241
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3		QQ O	365 GNTHTKHDVILHETSLFPGDTFDRLKLEDTETRLRNTGYFKSVSVYTVRSQLDPLDSNNL 424
oy g	242 GLARFQPGTPYDLDLILDFQQALEQNGHYSGASVQADFDRLOG	9. 0. 0.	287VPVKVSVTEV
& g	285 DRVPVKVSVTEVKRHKLETGIRLDSEYGLGGKIAYDYYNLFNKGYIGSVVWDMDKYETTL 344 1	QY Db	311 YGLGGKIAYDYYNLFNKGYIGSVVWDMDKYETTLAAGISQPRNYRGNYWTS 361
දි දි	345 AAGISQPRNYRGNYWTSNVSYNRSTTQNLEKRAFSGGIWYVRDRAGIDA 393 545 DVSFTDPWIGGDPFRTSYTANLFRRTISLVFDGADSSIRTFNGFDSPRVVRT 597	Qy Ub	362 NVSYNRSTTONLEKRAFSGGIWYVRDRAGIDARLGAEFLAEGRKIPGSDIDLGNSHATML 421
oy op	394PGSDIDL 413 	oy Db	422 TASWKRQLLNNVLHPENGHYLDGKIGTTLGTFLSSTALIRTSARAGYFFTP 472 : :    :::
Qy Dp	414 GNSHATMLTASWKRQLLNNVLHPENGHYLDGKIGTTLGTFLSSTALIRTSARAGY-FFTP 472 	Oy Dp	473 ENKKLGTFIIRGQAGYTVARDNADVPSGLMFRSGGASSVRGYELDSIGLA 522   1
Oy Op	473ENKKLGTFIIRGQAGYTVARDNADVPSGLMFRSGGASSVRGYELDSIG 520   :	Qy B	523 GPNGSVLPERALLVGSLEYQLPFTRTLSGAVFHDMGDAAANFKRMKLKHGSGLGVR- 578
Oy Dp	521 LAGPNGSVLPERALLVGSLEYQLPFTRTLSGAVFHDMGDAAANFKRWKL 569 1	Qy	579
Qy Db	570 KHGSGLGVRWFSPLAPFSFDIAY-GHSDKKIRWHISLGTRF 609 1	200	RESULT 34 E89731 Outer montron ontion velous (imported) o vilolla factidion (strain onto)
RESULT H81693 Outer	rain Nigg)	00002	functions and the state of the
0000	on Change 11-May-2000 Lberg, J.F.; White, O.; Hickey,	ZZZZ	ture 406, 151-157, 2000 Title: The genome sequence of the plant pathogen Xylella fastidiosa. Reference number: A82515, WID:20365717; PMID:10910347 Note: for a complete list of authors see reference number A59328 helow
Nuc A	Odson, R.; Gwinn, M.; Nelson, W.; DeBoy, R.; Kolonay, J.; McClarty, G.; Salzberg, Acids Res. 28, 1397-1406, 2000  Acids Res. 28, 1397-1406, 2000  Genome sequences of Chlamydia trachomatis MoPn and Chlamydia pneumoniae AR39.	वे वे वे	Accession: E82731 Status: preliminary Molecule type: DNA
44.0		444	Residues: 1-784 <slm> Cross-references: GB:AE003941; GB:AE003849; NID:g9105978; PIDN:AAF83856.1; GSPDB:G Experimental Source: strain 985c</slm>
# # # # Q	A;Residues: 1-792 <tet> A;Residues: 1-792 <tet> A;Residues: 1-792 <tet> A;Cross-references: GB:AE002320; GB:AE002160; NID:g7190551; PIDN:AAF39354.1; PID:g719055 A;Experimental source: strain Nigg (MoPn) C;Genetics:</tet></tet></tet>	X d o o d	Simpson, A.J.C.; Renach, F.C.; Artuda, P.; Abreu, F.A.; Acento, M.; Alvarenga, K. Indones, M. R.S.; Bueno, M.R.P.; Camargo, A.A.; Camargo, L.E.A.; Carraro, D.M.; Carre-Neto, E.; Docena, C.; El-Dorry, H.; Facincani, A.P.; Ferreira, A.J.S. bmitted to GenBank, June 2000
o omž	792; s 174: Gans 30.	รักซีลี เติ	A. A. C. J. Junqueira, M.L.; Kemper, E.L.; Kitajima, J.P.; Krieger, J.E.; Kuramae, E.E.; I. Chado, M.A.; Madeira, A.M.B.N.; Madeira, H.M.F.; Marino, C.L.; Marques, M.V.; Martin A; Atthors: Martins, E.M.F.; Matsukuma, A.Y.; Menck, C.F.M.; Miracca, E.C.; Miyaki, C. F. Ro,; Nunse, L.R.; Oliveira, M.A.; de Oliveira, M.C.; de Oliveira, R.C.; Palmieri, P.P.; M. Poca, B. T. A.
Oy Dp	DMVEEHLPLITQQQEEVLDKEQTGFLAEEAPDNVKTMLRKGYFSXVSLTEKDG 120	र्वे इसे बे	Authors: da Silva, A.C.R.; da Silva, F.B.; da Silva, A.M.; Silva Jr., W.A.; da Silva, F.B.; da Silva, A.M.; Silva Jr., W.A.; da Silva Silva, F.B.; da Silva, F.B.; da Silva, F.B.; da Silva, M.B.; da Silva, Si
6 64 64	121 AYTVHITPGPRTKIANVGVAILGDILSDGNLAEYYRNALENWQQPVGSDFDQDS 174 : ::	ਹੋਵੇਂਹੋ	Genetics: Gene: XF1046 Superfamily: protective surface antigen D-15
Oy Dp	175 WENSKTSVLGAVTRKGYPLAKLGNTRAAVNPDTATVDLNVVVDSGRPIAFGDFEIT 230     :		Ouery Match 6.2%; Score 197.5; DB 2; Length 784; Best Local Similarity 20.5%; Pred. No. 3.3e-05; Matches 136; Conservative 105; Mismatches 291; Indels 131; Gaps 28;
ογ		Qy Db	36 LFKNKSPDTESVKLKPKPVRIDTQDSEIKDMVEHLLPLITQQQESVLDKE 86

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Ompl protein precursor (U51683) [imported] - Agrobacterlum tumefaciens (strain C58, C C; Species: Agrobacterlum tumefaciens
C;Species: Agrobacterlum tumefaciens
C;Species: Agrobacterlum tumefaciens
C;Species: D97527
C;Accession: D97527
R;Goodner, B.; Hinkle, G.; Gattung, S.; Miller, N.; Blanchard, M.; Qurollo, B.; Goldm A.; Liu, F.; Wollam, C.; Allinger, M.; Doughty, D.; Scott, C.; Lappas, C.; Markelz, Science 294, 2323-2338, 2001
A;Title: Genome Sequence of the Plant Pathogen and Biotechnology Agent Agrobacterlum A;Recession: D97527
A;Status: preliminary
A;Accession: D97527
A;Status: preliminary
A;Residues: 1-774 <RUB>
A;Cross-references: GB:AE007869; PIDN:AAK87173.1; PID:g15156447; GSPDB:GN00169
C;Genetics:
A;Gene: AGR_C.2554
A;Map position: circular chromosome
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         EVLDKEQTGFLAEEAPDNVKTMLRSKGYFSSKVSLTEKDGAYTVHITPGPRTKIANVGVA 140
                                                                                                                                                                               -----ILGDILS---DGNLAEYYRNALENWQQPVGSDFDQDSWENSKTSVLGAVTRK 189
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             365 IEIRGNDKTRDYVIRREFDLNEGDAFNQVMVQRAKRRLEVLDFFQTVNISTARG-SEPDQ 423
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                424 VILVVDVVEKSTGEFSIGGGYTTGGESPGAQVEAAITERNFLGRGQYIRISAGAGQDDMR 483
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              411
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           502 QEFAGLGGDAKYVKTTFKGNYYQTLSQEADIVGLLGVGAGYIHEFGDDGVRIFDLFKN-S 660
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             412 ------DLGNSHATML----TASWKR-----QLLNNVLHPENGHYLDGKIG 447
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   507
                                                                                                 | : : | | | | | | | | EAIKAAYSHIGRSDATVNARTVDLGQG----RVNV-----VYEINEGSRTKIANIEFV
                                                                                                                                                                                                                              196 GNQAFSGRRLRDVISTKRSNPLSWLTRNDV------YDEGRLQADEETLRRFYYNR
                                                                                                                                                                                                                                                                                                                                        544 VQEKYDLFRGDAENYYAPALLEAAENSPWLRSSVSYSLTYSSIDDIKNPHDGLY--GRFI
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       -----NYRGNYWISNVSYNRSTIONLEKRAFSGGIWYVRDRAG-----
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        -----IDARLGAEFLAEGRK------IPGSDI-----
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   184 NYGLSFTEPYFLGYRLSAGFDVFRRSYRVNDDYDVEQTGGTIRFGLPITDNFSAGIAYSL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   448 TTLGTFLSSTALIRTSARACYFFTPENKKLGTFIIRGQAGYTVARDNADVPSGLMFRSGG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          ----HDMGDAAANFKRMKLKHGSGLGVRWFSPLAPFSFDIAY----GHSDKKIRWHISLG
                                                                                                                                                                                                                                                                                                      GYPLAKLGNTRAAVNPDTATVDLNVVVDSGRPIAFGDFEITGT-QRYPEQIVSGLARFQP
                                                                                                                                                                                                                                                                                                                                                                                                                         GTPYDL----DLLLDFQQALEQNGHYSGASVQADFDR-LQGDRVPVKVSVTEVKRHKLE-
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             ---TGIRLDSEYGLGGKIAYDYYNLFNKGYIGSV---VWDMDKYET---TLAAGISOPR-
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      ASSVRGYELDSIG--LAGPNGS--VLPERALLVGSLEYQ-----LPFTRTLSGAVF----
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103 VKERSVVNNVLFQGNKKIKDPDLARAVQLKPRAPFDMATMEAD-
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Pred. No. 0.00022;
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Best Local Similarity
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C.Species: Brucella melitensis
C.Date: 01-Feb-2002 #sequence_revision 01-Feb-2002 #text_change 01-Feb-2002
C.Accession: A1335
R.Delvecchio, V.G.; Kapatral, V.; Redkar, R.J.; Patra, G.; Mujer, C.; Los, T.; Ivanova, Mazur, M.; Goltsman, E.; Selkov, E.; Elzer, P.H.; Hagius, S.; O'Callaghan, D.; Letess Proc. Natl. Acad. Sci. U.S.A. 99, 443-448, 2002
A.Tile: The genome sequence of the facultative intracellular pathogen Brucella melitens A; Reference number: AD3252; PMID:11756688
A; Accession: AH335
A; Sesidues: 1-781 <KUR>
A; Molecule type: DNA
A; Residues: 1-781 <KUR>
A; Residues: 1-781 <KUR>
A; Residues: 1-781 <KUR>
A; Cross-references: GB: RE008917; PIDN: AALS2011.1; PID:g17982775; GSPDB: GN00190
A; Experimental source: strain 16M
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  30;
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    365
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  366 NRSTTQNLEKRAFSG----GI------WYVRDRAGIDARLGAEFLAEGRKIPGSD-- 410
                                                                                                                                                                                                     VT-----GNTV-LPQEKIEKLVIPKTGDIFSRVLLEYSSAAIINTLSNIGYAFSKV- 328
                                                                                                                                                                                                                                                                      257
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       449 QLSQNNFLGSGNRVSVDASRSRYQDRXSFSYTNP-----FFTDNGVSLGYNLAYQKLDY 502
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            --IDLGNS-----HATMLTASWKRQLLNNVLHPENGHY------LDG-----KIGT 448
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              449 TLGTF--LSSTALIRTSARAGYFFTPENKKLGTFIIRGQAGYTVARDNADVPSGL----M 502
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           661
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   722 FLDFGNVFNGVNNFKANELRASSGVALLWRAPIGPISISYAFPIKKENNDEIERLQFTFG 781
                         O-TGFLAEEAPDNVKTMLRSKGYF----SSKVSLT-EKDGAY-TVHITPGPRTKIANVG 138
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             SDFNAAOYNSKRMSGOTIFGIPITENDTVSWVI----GADSNQITTF-----PGSTPK 551
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                                                                                                                                            VAILGDILSDGNLAEYYRNALENWQQP-VGSDFDQDSWENSKTSVLGAVTRKGYPLAKLG 197
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                                                              224 KLSGDL----EKLNSWYLDRGYVDFNIDSTQVSISPEKHNMFITAGVTEGDQYKISSIK
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Best Local Similarity 19.5%; Pred. No. 5.2e-05;
Matches 141; Conservative 115; Mismatches 284;
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B.; Goldm Markelz,

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RESULT 38
AC1816
hypothetical protein alr0075 [imported] - Nostoc sp. (strain PCC 7120)
C; Species: Nostoc sp.
C; Species: Nostoc sp.
A; Note: Nostoc sp.
A; Note: Nostoc sp.
C; Date: 14-Dec.2001 #sequence_revision 14-Dec.2001 #text_change 30-Jun-2002
C; Date: 14-Dec.2001 #sequence_revision 14-Dec.2001 #text_change 30-Jun-2002
C; Accession: AC1816
R; Kaneko, T: Nakamura, Y: Wolk, C.P.; Kuritz, T.; Sasamoto, S.; Watanabe, A.; Irig
Nakazaki, N: Shimpo, S.; Sugimoto, M.; Takazawa, M.; Yamada, M.; Yasuda, M.; Tabat
DNA Res. B, 205-213, 2001
A; Reference number: AB1807; MUID:2159285; PMID:11759840
A; Reference number: AB1807; MUID:2159285; PMID:11759840
A; Residues: preliminary
A; Wolecule type: DNA
A; Residues: 1-491 < KUR>
A; Cross-references: GB:BA000019; PIDN:BAB77599.1; PID:g17135053; GSPDB:GN00179
A; Experimental source: strain PCC 7120
C; Genetics:
A; Genetics:
                                                146 LSDGNLAEYYRNALENWOOPVGSDFDQDSWENSKTSVLGAVTRKGYPLAKLGNTRAAVNP 209
                                                                                                                                                                                                                                  321
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        ERALLVGSLEYQLP-----FTRTLSGAVFHDMGDAAAN----FKRMK----LKHGSGL 575
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    GTTYFAASAEVTAPMPGVPEDFGLRLAG--FVDAGTMYGNKVSTSQTVKDDNSIRASAGI 736
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     DSGRPIAFGDFEITGTQRYPEQIVSGLARFQPGTPYDLDLLLDFQQALEQNGHYSGASVQ 276
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               ---GDRVPVKVSVTEVKRHKLET---GIRLDSEYGLGGK 316
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             || || || : || : : || : : || |: ADLGRLQKLESFTYVRAYREENPFGVRI----IYDVKERRFPSWNYGIGNNDDIGLSGR 166
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       IAYDYYNLFNKGY1GSVVWDMDKYETTLAAGISQPRNYRGNYWTSNVSYNRSTT---- 370
                                                                               TVPGVDGSELQGLVETRQ---GASYSAKEVQQSMEAISKRVAGEGYPFARV-TPRGDRDM
                                                                                                                                                                        SGNTIGUTYIVDQGERAYVERIEIRGNTRTRDYVIRREFDISEGDAFNQTIITAAKRRLE
                                                                                                                                                                                                                                                                      403 ALGYFSKVNIST----AGGSAPDRVVIVVDVEDQSTGSFGIGAGYSQNDGVLLEASVEE
                                                                                                                                                                                                                                                                                                                           322 YNLFNKG-YIGSVVWDMDKYETTLAAGISQPRNYRGNYWTSN-VSYNRSTTQNLEKRAFS
                                                                                                                                                                                                                                                                                                                                                                  458 KNFLGRGOYI-----RVAAGAGEDDARTYSLSFTEPYFLGYRLAAGFDLFKNOSK
                                                                                                                                                                                                                                                                                                                                                                                                                                               EEA----LRQFYYNRGYADFRVVSSDAVLDESKNEYTISITVDEGKKYDFGNVAV----ES
                                                                                                                                      DTATVDLNVVVDSGRP1AFGDFEITGTQRYPEQIVSGLARFQPGTPYDLDLLLDFQQALE
                                                                                                                                                                                                                                  266 QNGHYSGASVQADFDRLQG----DRVPVKVSVTEVKRHKLETGIRLDSEYGLGGKIAYDY
                                                                                                                                                                                                                                                                                                                                                                                                                    GGIWYVRDRAGIDARLGA-------EFLAEGRKIPGSDIDLGNSHATMLTA-
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Match 5.6%; Score 179; DB 2; Local Similarity 21.6%; Pred. No. 0.00028; Les 106; Conservative 56; Mismatches 154
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                ADFDRLO-----
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Best Local Simil
Matches 106; (
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Cispecies: Agrobacterium tumefaciens (st
Riwood, D.W.; Setubal, J.C.; Kaul, R.; Monks, D.; Chen, L.; Wood, G.E.; Chen, Y.; Woo, I.
Riwood, D.W.; Setubal, Grant, C.; Guenthner, D.; Kutyavin, T.; Levy, R.; Li, M.; McClell
Science 294, 2317-2323, 2001
AiAuthors: Yoo, H.; Tao, Y.; Biddle, P.; Jung, M.; Krespan, W.; Perry, M.; Gordon-Kamm,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 A;Title: The Genome of the Natural Genetic Engineer Agrobacterium tumefaciens C58. A;Reference number: AB2577; PMID:11743193 A;Accession: AE2746
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      25;
  25;
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A;Molecule type: DNA
A;Residues: 1-774 <KUR>
A;Cross-references: GB:AED008688; PIDN:AAL42387.1; PID:g17739796; GSPDB:GN00186
A;Experimental source: strain C58 (Dupont)
                                             EEAPDNVKTMLRSKGY-----FSSKVSLTEKDGAYTVHIT--PGPRTKIANVGVAILGDI 145
                                                                                                                                      LSDGNLAEYYRNALENWQQPVGSDFDQDSWENSKTSVLGAVTRKGYPLAKLGNTRAAVNP 205
                                                                                                                                                                   | :| | : | | : | | 458 KNFLGRGOYI------RVAAGAGEDDARTYSLSFTEPYFLGYRLAAGFDLFKNOSK 507
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  SWKRQLLNNVLHPENGHYLDGK------1GTTLGTFLSSTALIRTSARAGYFFT-- 471
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | : : | : | : | : | : | : | DWTQSILSNTL---NYNTLDDRNMPREGWQAALTNEFAGLGGDSEYYKIYAKARYYYTLS 624
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  PENKKLGTFIIRGQAGYTV-ARDNADVPSGLMFRSGGASSVRGYELDSIGLAGPNGSVLP 530
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             531 ERALLVGSLEYQLP-----FTRTLSGAVFHDMGDAAAN----FKRMK----LKHGSGL 575
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               679 GTTYFAASAEVTAPMPGVPEDFGLRLAG--FVDAGTMYGNKVSTSQTVKDDNSIRASAGI 736
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               EEAPDNVKIMLRSKGY----FSSKVSLTEKDGAYTVHIT--PGPRTKIANVGVAILGDI 145
                                                                                                                                                                                                                             DTATVDLNVVVDSGRPIAFGDFEITGTQRYPEQIVSGLARFQPGTPYDLDLLLDFQQALE 265
                                                                                                                                                                                                                                                                                                                         QNGHYSGASVQADFDRLQG----DRVPVKVSVTEVKRHKLETGIRLDSEYGLGGKIAYDY 321
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                ---EFLAEGRKIPGSDIDLGNSHATMLTA- 423
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 EEA---LROFYYNRGYADFRVVSSDAVLDESKNEYTISITVDEGKKYDFGNVAV----ES
                                                                                                                                                                                                                                                                                                                                                                                                                  322 YNLFNKG-YIGSVVWDMDKYETTLAAGISQPRNYRGNYWTSN-VSYNRSTTQNLEKRAFS
  98;
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272; Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      GVRWFSPLAPFSFD----IAYGHSDKKIRWHISLGTRF 609
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      737 GVMWASPFGPIRVDYAIPIAKEDYDEEQRFRFGMSNTF 774
Mismatches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           380 GGIWYVRDRAGIDARLGA------
87;
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Conservative
Matches 121;
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Oy 415NSHATMLTASWKROLLNNVLHPENGHYLDGKIGTTLGTFLSST 457  Db 636 SPEIKGIWDRDYHTPITSSFTLDVSYDNTDDYYFPRNGVIFSSYATMSGLPSSGTLNSWN 695  Oy 458 ALIRTSARAGYFFTPENKKGFFIIRGQAGYTVARDNADVPSGLMFRSGG 507	R:Shirai, M.; Hirakwa, H.; Kimoto, M.; Tabuchi, M.; Kishi, F.; Ouchi, K.; Shiba, T.;  Nucleic Acids Res. 28, 2311-2314, 2000 A; Title: Comparison of Whole genomes of chlamydia pneumoniae J138. A; Reference number: A86491; MUID:20330349; PMID:10871362 A; Accession: D86528 A; Status: preliminary A; Mocule type: DMA A; Residues: 1-790 <sto- a;="" asc="" c;="" cross-references:="" experimental="" gb:ba00000000000000000000000000000000000<="" gb:ba0000008;="" gb:ba000008;="" gene:="" genetics:="" gree:="" greetics:="" gspdb:gn00142="" j138="" nid:98978674;="" pidn:ba998510.1;="" pidn:baa98510.1;="" source:="" strain="" th=""><th>Qy         80 EEVLDKEQTGFLAEEAPDNVKTMLRSKGYFSSKVSLTEKDGATVHITPGPRTK 133           13 NULEEREKFLKGLDDLRTYTLKRGYFASSVDYSLEHNQEKGHIDVLIKINEGPCGK 1B8           Qy         134 IANVGVALIG</th></sto->	Qy         80 EEVLDKEQTGFLAEEAPDNVKTMLRSKGYFSSKVSLTEKDGATVHITPGPRTK 133           13 NULEEREKFLKGLDDLRTYTLKRGYFASSVDYSLEHNQEKGHIDVLIKINEGPCGK 1B8           Qy         134 IANVGVALIG
Db 167 VSYKDANISGLNDQLATTVQVSTKDVQFNSRFTSPYRLG 205  Qy 371	PF71910 probable outer membrane protein - Helicobacter pylori (strain J99) probable outer membrane protein - Helicobacter pylori A; Variety: strain J99 C;Species: Helicobacter pylori A; Variety: strain J99 C;Sate: 12-Feb-1999 #sequence_revision 12-Feb-1999 #text_change 08-Oct-1999 C;Accession: F71910 R;Alm, R.A.; Ling, L.S.L.; Moir, D.T.; King, B.L.; Brown, E.D.; Doig, P.C.; Smith, Jrites Genomic sequence comparison of two unrelated isolates of the human gastril A;Reference number: A71800; MUD: 99120557; PMID: 9923682 A;Title: Genomic sequence comparison of two unrelated isolates of the human gastril A;Reference number: A71800; MUD: 99120557; PMID: 9923682 A;Accession: F71910 A;Accuse type: DNA A;Accession: F71910 A;Status: preliminary A;Accession: F71910 A;Status: preliminary A;Accession: F71910 A;Status: GB.AE001492; GB.AE001439; NID: 94155147; PIDN: AAD06181.1; PID: 9 C;Generics: Jh0600	Query Match         5.58; Score 174; DB 2; Length 906;           Best Local Similarity         21.08; Pred. No. 0.0016;           Matches 123; Conservative 72; Mismatches 202; Indels 188; Gaps 23;           Qy 186 VTRKGYPLAKLGNTRAAVNPDTATVDLNVVV·····DSGRPIAFGDFEITGTQRYPEQI 239           1   1   1   1   1   1   1   1   1   1

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;	TONLEKRAFSGGI WYVRD	SKDYAVQTYGGNVSTTYILN	SWKRQLLNNVLHPENG	: ::	LGTFIIRGOAGYTVARDNA-	-GILKIKGEAQFIKPYSNTT	PERALLVGSLEYQLPFTR1	SSLLI-SEEFQYPLIRQPNISAFVFLDSGFVC
478	370	530	424	290	477	640	530	698
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